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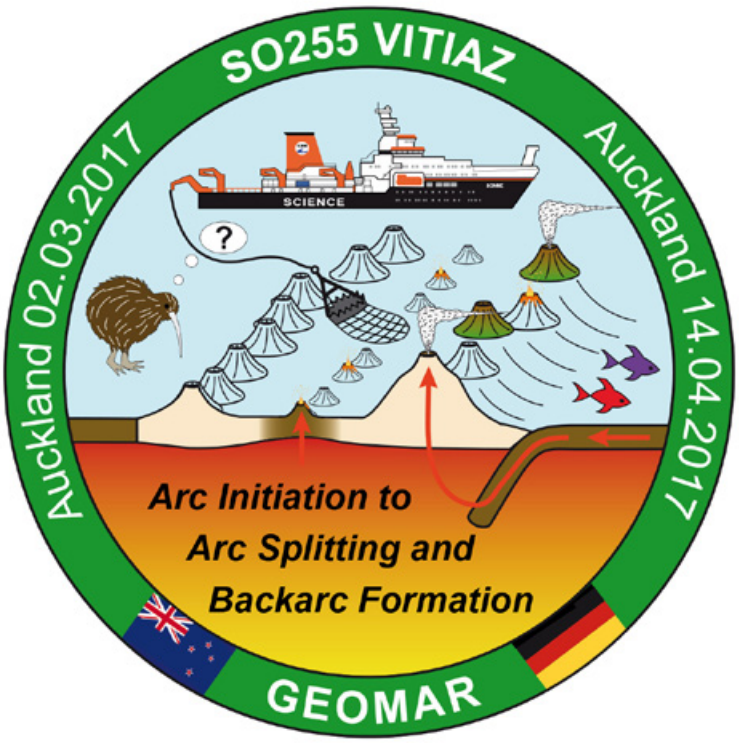
Helmholtz-Zentrum für Ozeanforschung Kiel

RV SONNE Fahrtbericht / Cruise Report SO255

VITIAZ – The Life Cycle of the Vitiaz-Kermadec Arc / Backarc System: from Arc Initiation to Splitting and Backarc Basin Formation

Auckland (New Zealand) - Auckland (New Zealand)
02.03.-14.04.2017



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Nr. 35 (N. Ser.)

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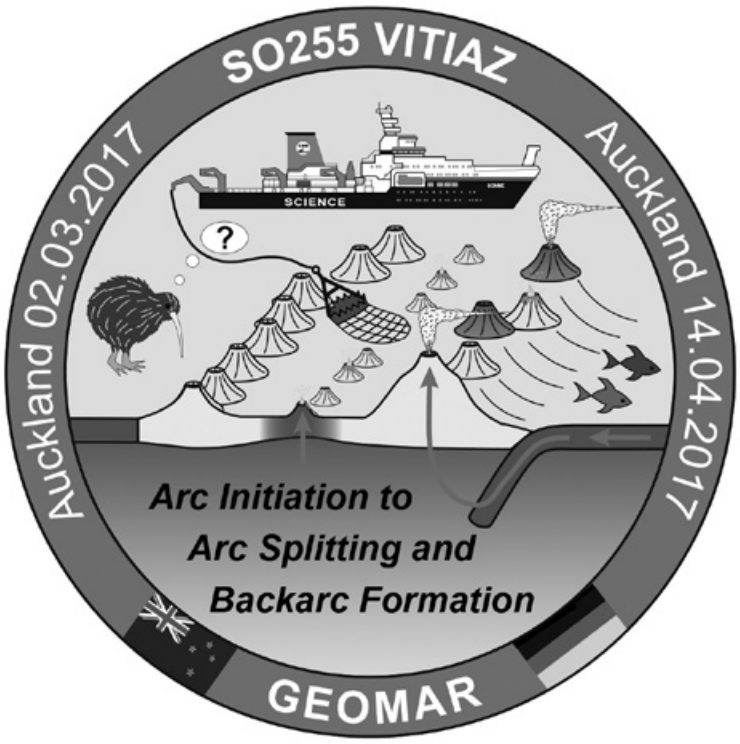

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1.1 SUMMARY

The R/V SONNE expedition SO255 is part of the research project VITIAZ, conducted in close cooperation with New Zealandic, U.S. American, and Japanese scientists. The overarching goal of VITIAZ is to elucidate the physical and chemical conditions that control the development of subduction zones, including subduction initiation, evolution of mature arc systems, and the transition from arc splitting to backarc basin generation. This approach should also provide basic data for a better evaluation of the impact of subduction volcanism on the environment. Cruise SO255 mapped and sampled magmatic structures at the Kermadec Fore Arc, the Kermadec Ridge, the Havre Trough, and the Colville Ridge (SW-Pacific) using Kongsberg EM122 and EM710 multi-beam echo sounding systems, an Atlas PARASOUND DS P-70 sub-bottom profiler, and chain bag dredges. Besides extensive profiling, a total of 165 dredge hauls in an average water depth of 2,500 m were carried out on SO255. Of these, 137 (= 83%) delivered in situ samples of which 102 obtained lava or subvolcanic rocks, 69 volcaniclastics, and 30 sedimentary rocks. No equipment was lost or seriously damaged. The on shore work program at GEOMAR and cooperating institutions will include volcanological, geochronological, petrological and geochemical studies on igneous samples obtained during the cruise. The results of VITIAZ will be integrated with those of previous campaigns (e.g. SO249 BERING), and work carried out within the GeoPRISMS initiative.

The geological program of the cruise has been completed by biological investigations intending (1) to collect planktonic gastropod specimens for morphological and molecular analysis to understand their taxonomy, biogeography and evolution; (2) to use water samples to study degradation processes in the deep sea; and (3) to describe the benthic diversity of deep-sea invertebrates in the working area by collecting macro benthos from the dredged rocks.

1.2 ZUSAMMENFASSUNG

Die FS. SONNE-Expedition SO255 ist Teil des Forschungsprojektes VITIAZ, das in enger Kooperation mit Kollegen aus Neuseeland, den U.S.A. und Japan durchgeführt wird. Das übergeordnete Ziel von VITIAZ ist die Rekonstruktion der Bildung und Entwicklung des Vitiaz-Kermadec Arc- und Backarc-Systems im Norden von Neuseeland. Insbesondere werden Prozesse untersucht, die die Bildung und Entwicklung von Subduktionssystemen sowie den Übergang von der Aufspaltung eines Inselbogens zur Ausbildung eines Back-Arc-Beckens kontrollieren. Damit sollen auch Basisdaten für eine bessere Einschätzung der Auswirkungen von Subduktionsvulkanismus auf die Umwelt erfasst werden. Während SO255 wurden geologische und morphologische Untersuchungen an den Colville- und Kermadecrücken sowie im Havre Trough und am Kermadec Fore Arc durchgeführt. Neben umfangreichen Kartierungen mit den Kongsberg EM122 und EM710 Fächerecholoten und Atlas PARASOUND P70 Sedimentprofilierungen wurden magmatische und sedimentäre Strukturen mit insgesamt 165 Dredgezügen beprobt, wovon 137 (= 83%) *in situ* Proben erbrachten. Von diesen lieferten 102 Lava und/oder subvulkanische Gesteine, 69 vulkaniklastische Gesteine (u.a. Brekzien die Lavafragmente enthalten) und 30 Sedimentgesteine. Es wurde keine Ausrüstung verloren oder nennenswert beschädigt. Insgesamt hat SO255 seine wichtigsten Ziele erreicht und der auf dieser Reise gewonnene Probensatz repräsentiert die bis heute bei weitem umfassendste Beprobung des Arbeitsgebietes. Die auf SO255 gewonnenen Proben werden am GEOMAR und bei unseren Kooperationspartnern, petrologisch, geochemisch und geochronologisch bearbeitet. Die Ergebnisse von SO255 VITIAZ werden in die früherer Projekte (z.B. SO249 BERING) und in die Untersuchungen des laufenden "GeoPRISMS" Programms integriert.

Das geologische Programm von SO255 wurde durch biologische Programme vervollständigt. Im Rahmen dieser Programme wurden (1) planktonische Gastropoden für morphologische und molekulare Analysen beprobt um ein besseres Verständnis von deren Taxonomie, Biogeographie and Entwicklung zu erreichen; (2) Wasserproben genutzt um die Degradationsprozesse in der Tiefsee zu untersuchen und (3) die auf den gedredgten Gesteinen aufsitzende Makrofauna abgesammelt, um die Diversität von Tiefsee-Invertebraten im Untersuchungsgebiet zu dokumentieren.

2. PARTICIPANTS

2.1. SHIP'S CREW

Mallon, Lutz	Master	Hermesmeyer, Dieter	Chief Engin.
Aden, Nils-Arne	Chief Mate	Stegmann, Tim	2nd Engineer
Burzlaff, Stefan	1nd Mate	Horsel, Roman	2nd Engineer
Birnbaum-Feteke, Tilo	2nd Mate	Münch, Lothar	Motorman
Leppin, Jörg	Chief Electronician	Talpai, Matyas	Motorman
Plöger, Miriam	Electronician	Bolik, Torsten	Motorman
Borchert, Wolfgang	System Operator	Blohm, Volker	Fitter
Pregler, Hermann	System Operator	Ovcharenko, Timor	Electrician
Walther, Anke	Surgeon	de Buhr, Henning	Electrician
Garnitz, Andre	Chief Cook	Vogt, Alexander	Chief Steward
Wienekamp, Frank	2nd Cook	Hinz, Nina	Stewardess
Bierstedt, Torsten	Boatswain	Kluge, Sylvia	Stewardess
Stängl, Günther	A.B.	Kroeger, Sven	Steward
Fricke, Ingo	A.B.	Eidam, Oliver	A.B.
Ernst, Arnold	A.B.	Ross, Reno	A.B.
Koch, Stefan	A.B.	Vogel, Dennis	A.B.

2.2. PRINCIPAL INVESTIGATORS FOR SO255 BERING *(in alphabetical order)*

Hauff, Folkmar	GEOMAR
Hoernle, Kaj	GEOMAR (Project Coordinator)
Timm, Christian	GNS
Werner, Reinhard	GEOMAR

2.3. SHIPBOARD SCIENTIFIC PARTY *(in alphabetical order)*

1.	Bauer, Elisabeth	Student	GEOMAR
2.	Bush, Chelsea	Student	GSU
3.	Endres, Sonja	Senior Scientist	GEOMAR
4.	Gill, James	Senior Scientist	UCSC
5.	Hauff, Folkmar	Senior Scientist	GEOMAR
6.	Hirai, Yasuhiro	Student	JAMSTEC
7.	Hoernle, Kaj	Chief Scientist	GEOMAR
8.	Jutzeler, Martin	Senior Scientist	UTAS
9.	Koch, Steffen	Student	GEOMAR
10.	Lampe, Vanessa	Student	GEOMAR
11.	McKeon, Jeffrey	Student	GSU
12.	Mögeltönder, Jasmin	Team Assistant	GEOMAR
13.	Rahmsdorf, Charlotte	Student	GEOMAR
14.	Simon, Ina	PhD-Student	GEOMAR
15.	Tamura, Yoshihiko	Senior Scientist	JAMSTEC
16.	Timm, Christian	Senior Scientist	GNS
17.	Todd, Erin	Senior Scientist	USGS
18.	Unger Moreno, Katharina	Student	GEOMAR
19.	Wall-Palmer, Deborah	Senior Scientist	Plymouth Univ.
20.	Wellschmidt, Gesine	Student	GEOMAR
21.	Werner, Reinhard	Senior Scientist	GEOMAR
22.	Witte, Matthias	PhD-Student	GEOMAR
23.	Zeppenfeld, Heiko	Student	GEOMAR

The SO255 Shipboard Scientific Party (photo: Torsten Bierstedt).

2.4. INSTITUTIONS

GEOMAR	Helmholtz-Zentrum für Ozeanforschung Kiel, Germany, www.geomar.de
GSU	Georgia State University, Atlanta, U.S.A., www.gsu.edu
GNS	Institute of Geological and Nuclear Sciences, Lower Hutt, New Zealand, www.gns.cri.nz
JAMSTEC	Japan Agency for Marine Earth Science and Technology, Yokosuka, Japan, www.jamstec.go.jp
Plymouth Univ.	Plymouth University, Plymouth, U.K., www.plymouth.ac.uk
UCSC	University of California Santa Cruz, Santa Cruz, U.S.A., www.ucsc.edu
USGS	United States Geological Survey, Menlo Park, U.S.A., www.usgs.gov
UTAS	University of Tasmania, Hobart, Australia, www.utas.edu.au

3. NARRATIVE OF THE CRUISE

(K. Hoernle, D. Wall-Palmer, S. Endres, R. Werner)

On March 01, the scientists boarded R/V SONNE, unpacked the sampling equipment and began to set up the laboratories in preparation for cruise SO255. After the boarding of some additional technical personal and a member of the funding agency, R/V SONNE sailed on the afternoon March 02 from Auckland (Fig. 3.1). After a day of carrying out tests on the ship's underwater sound, SONNE returned to Auckland, to let off the technical personnel and took a last scientist on board who had to postpone her trip due to illness. Saturday afternoon SONNE again left the Auckland harbor to officially begin the SO255 cruise (Fig. 3.2). On Saturday, March 04, we arrived at our first work station above the Colville Ridge and began with the scientific program around noon-time.

Fig. 3.1: Downtown Auckland from R/V SONNE. (photo: Kaj Hoernle)

Fig. 3.2: Goodbye Auckland. (photo: Kaj Hoernle)

During the next week, we sampled a west to east profile across the Kermadec Arc/Backarc system between 34-36°S latitudes. After a two successful dredges on a block rifted from the Colville Ridge, we began dredging ridge-type and conical seamount structures in the Havre Trough. On March 06, we deployed the CTD for the first time on this cruise in order to record a sound profile through the water column. Such sound profiles are required to calibrate the multi-beam system used for mapping the seafloor to find appropriate sampling sites for dredging. On SO255, biological oceanographers used this opportunity to take samples with the CTD rosette water sampler to study degradation processes in the deep sea to depths of 4,000 m. On March 07, we sampled the 1,800 m high Gill Volcano, which is named after one of the American scientists on board. Afterwards we carried out the first haul with the plankton net. As SONNE progressed eastwards, we reached the Kibblewhite volcanic front volcano, which yielded lava samples and pumice. After the volcanic front, we proceeded on to the Kermadec Ridge, which million of years ago was attached to the Colville Ridge, forming the older Vitiaz volcanic arc.

From March 10 on, we worked at western wall of the Kermadec deep-sea trench carrying out dredges at depths of up to 8,800 m, being the deepest dredges carried out thus far with the new SONNE and probably also with the old SONNE. Unfortunately most of the dredges only brought up semi-consolidated mud or sedimentary rocks, reflecting sediments accreted to the forearc. Three dredges, however, recovered a variety of rocks ranging from sediments with abundant small volcanic clasts to a variety of lava samples.

On March 16, we returned to the Kermadec Arc and carried out three successful dredges on the west-facing rifted scarp of the Kermadec Ridge. Then we proceeded to the Giggenbach seamount cluster, successfully sampling five seamounts, which brought large amounts of basaltic to dacitic lavas and pumice (Figs. 3.3 and 3.4). Some of the pumice is most likely related to the Havre eruption in 2012, which created a huge pumice raft (covering an area twice the size of New Zealand). For much of the third week of the cruise, the weather was stormy and seas rough. Almost as if planned, the winds died down, the sun came out and the seas calmed for the

Bergfest (mid-term party). During the Bergfest we mapped profiles across the Havre Trough and along the Colville Ridge to identify future dredge sites.

Fig. 3.3: A nearly full dredge of pumice being emptied on deck (photo: Kaj Hoernle).

Fig. 3.4: Boxes of pumice in the lab waiting to be described and packaged for more detailed studies after the cruise. (photo: Kaj Hoernle)

The beginning of fourth week was spent sampling our northernmost profile between c. 28-29°S latitudes. The sampling was very successful on the Kermadec Ridge and in the eastern and younger portion of the Havre Trough. We were even able to sample the Havre Trough basement by dredging one of the fault scarps forming a graben wall. On Tuesday, March 21, the dredging came to a halt due to problems with the deep-sea winch. As a result we spent the next 36 hours mapping areas of the Colville Ridge in preparation for dredging and deploying the plankton net. On March 22 we carried out our fifth and most successful deployment of the plankton net (Fig. 3.5). A huge variety of planktonic creatures and large numbers of our target group, swimming gastropods (snails) known as pteropods and heteropods, were recovered in the net (Fig. 3.6). Unfortunately it turned out that the winch cannot be fixed at sea. However, generously it was decided to continue dredging using the other deep sea winch holding an optical fiber cable. Early Thursday morning, we were able to resume sampling of the Colville Ridge and seamounts west of the ridge. Recovering relatively fresh volcanic material has proved challenging, because most of the samples are volcaniclastic, made up of small fragments of often altered glassy volcanic material. Nevertheless, we have recovered some relatively fresh lavas which can be used for age dating and geochemical analyses. The weather for most of the fourth week of SO255 week was gorgeous and the seas very calm (Fig. 3.7), providing also the opportunity to test the life boats.

Fig. 3.5: Deployment of the plankton net. (photo: Deborah Wall-Palmer)

Fig. 3.6: Heteropod Atlanta echinogyra (zooplankton). (photo: Deborah Wall-Palmer)

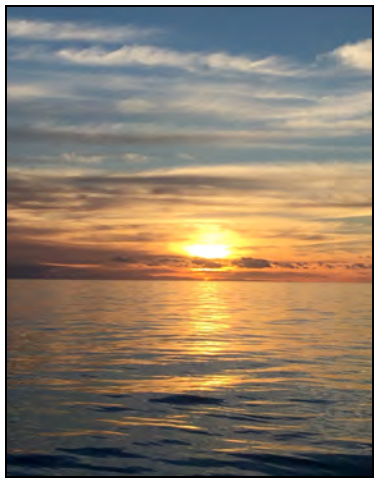

Fig. 3.7: The end of another successful day on board. (photo: Kaj Hoernle)

From Monday, March 27, until Friday, March 31, we sampled volcanic structures within the Havre Trough between 29–31°S latitudes in predominantly rainy weather conditions. All of the sampling was carried out in the eastern half of the Havre Trough due to the western half consisting primarily of a large sediment-filled basins and smooth basement morphology. In contrast the eastern half of the Havre Trough contained abundant small cone- and ridge-like structures, as well as some grabens with steep walls, that were successfully sampled by dredging. The most spectacular discovery of the week is what appears to be a volcanic structure with >2 km caldera in the middle of it (Fig. 3.8). Although calderas are common on the volcanic front in this region, none have been previously discovered this far in the backarc. Two dredges were carried out on the inside caldera walls and two outside the caldera. Most samples were dacitic to rhyolitic in composition but some samples from outside the caldera appear to be andesitic. On Saturday, April 01, we began dredging on the Kermadec Ridge (between 31-33°S), in order to get older samples predating the splitting of the Vitiaz Arc into the Kermadec and Colville Ridges. We recovered a mix of volcaniclastic rocks and fresh lavas (Fig. 3.9).

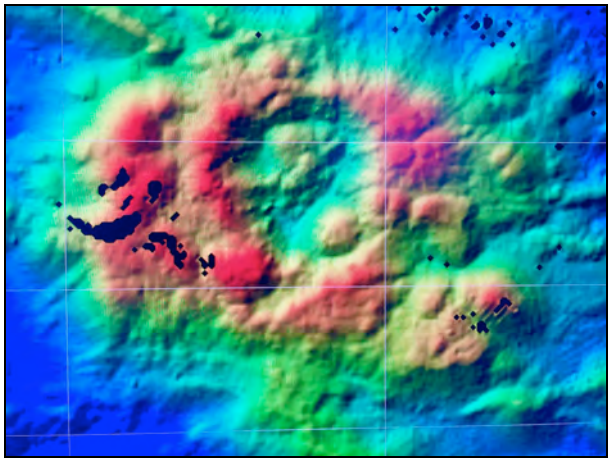

Fig. 3.8: Volcanic field with 2 km diameter caldera in the middle and resurgent domes in the caldera. Both inner and outer walls of the caldera were successfully dredged.

Fig. 3.9: A dredge from the Kermadec Ridge with large boulders of volcanic rocks: the beginning of a long night. (photo: Kaj Hoernle)

From Monday, April 03, to Friday, April 09, we carried out our last sampling profile across the Kermadec Arc and Havre Trough, including sampling of the Kermadec and Colville Ridges. After completing the sampling of the Haugaroa Volcano in the volcanic front early Monday morning, we spent the next two days traversing the Havre Trough along a NW-SE sampling profile. We sampled the margin of a 4,000 m deep basin, several NE-SW trending ridge-like structures and some small cones. Wednesday was spent sampling the deeper portions of a rifted scarp of the Colville Ridge. Then we crossed the Havre Trough again sampling more basin margins, ridges and small cones, ending at the Kuiwai volcanic front stratovolcano, which we sampled on Thursday. On Friday we dredged several volcanic cones south of Kuiwai and on Saturday we carried out several dredges on the Ngatoroirangi stratovolcano. Saturday night, we recovered a nice array of mafic samples from two cones on the Kermadec Ridge, as well as a nearly full dredge of fresh lavas from the Kermadec Ridge. The final dredge of the cruise was carried out Sunday at noon on the Sonne stratovolcano, named after the old R/V SONNE, which unfortunately was empty.

Of our three major goals, we were very successful at sampling the full variety of structures in the Havre Trough between 28-35°S, recovering a wide array of fresh lavas ranging from mafic basalts to rhyolites (Fig. 3.10). Sampling of the Kermadec and Colville Ridges (former Vitiaz Arc) between the aforementioned latitudes was also successful, bringing up a large variety of lavas and volcaniclastic rocks. We had the least success at recovering volcanic rocks from the forearc, where most dredges contained mud and sedimentary rocks despite dredging on very steep slopes, suggesting that the southern Kermadec forearc is largely accretionary. Besides extensive multi-beam mapping and sediment echo sounder profiling, a total of 165 dredge hauls in an average water depth of 2,500 m were carried out on SO255. Of these, 137 (= 83%) delivered in

situ samples of which 102 obtained lava or subvolcanic rocks, 69 volcaniclastics, and 30 sedimentary rocks. No equipment was lost or seriously damaged. The zooplankton sampling goals were achieved through the collection of three vertical net hauls and four oblique net tows. Over 6,900 specimens of planktonic gastropods from 37 species were collected, providing abundant material for future morphological and molecular analysis. Four CTD deployments and underway water sampling yielded sufficient water samples for the microbiological experiments (Fig. 3.11). Huge amounts of sample vials were packed and prepared for shipping to Kiel. Furthermore a variety of macrofaunal specimens has been collected from the rocks. All macrofauna samples will be transferred to the Museum für Naturkunde (Berlin, Germany), where they will be re-assessed and then distributed to colleagues for species identification.

Fig. 3.10: Scientists excited about recovering a variety of volcanic rocks from volcanic structures in the Havre Trough. (photo: GEOMAR)

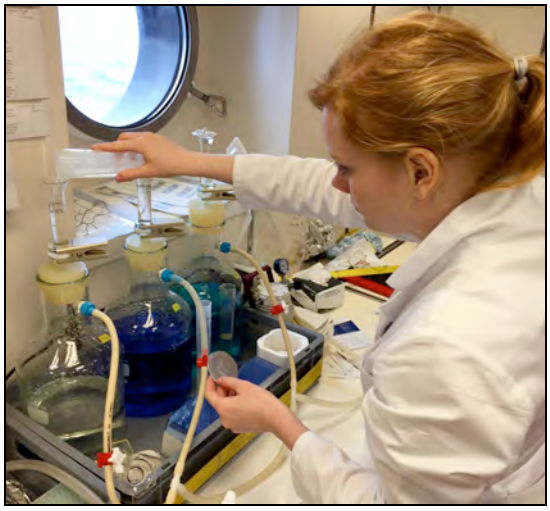

Fig. 3.11: Brewing up some magic potions? No, just dyeing and filtering bacteria from seawater samples. (photo: Kaj Hoernle)

On Sunday, April 09, R/V SONNE headed towards Auckland. In the evening we celebrated the end of work program, several birthdays and the retirement of one of the ship's crew by grilling on the deck (Fig. 3.12). On Tuesday, April 11, we finally reached the port of Auckland at 08:00 am (Fig. 3.13). The cruise ended three days earlier than originally scheduled, so that the winch holding the deep-sea cable can be checked by a winch technician and, if possible, fixed before the next cruise. The transit to Auckland and the days in port were used by the scientists for preliminary studies of the data and samples as well as for cleaning, maintenance, and packing of the equipment. Most scientists disembarked as scheduled on April 15 in the morning.

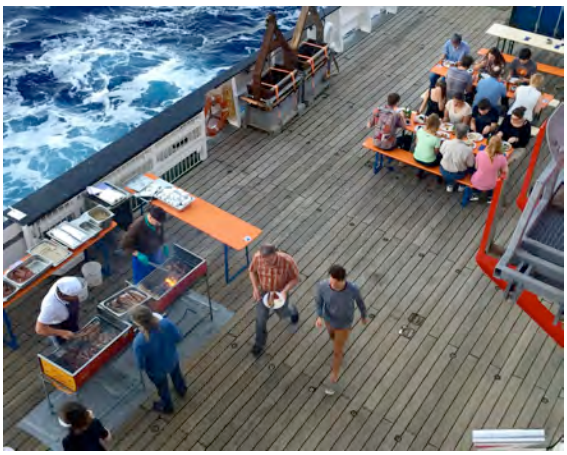

Fig. 3.12: Grilling on deck to celebrate the end of a successful cruise, several birthdays and one of the crew's last voyages before retiring. (photo: Kaj Hoernle)

Fig. 3.13: Auckland upon arrival of R/V SONNE at the end of SO255 expedition. (photo: Gesine Wellschmidt)

Figure 3.14 shows an overview of the sampling stations and the ship´s tracks of R/V SONNE cruise SO255. For more detailed maps see chapter 7.

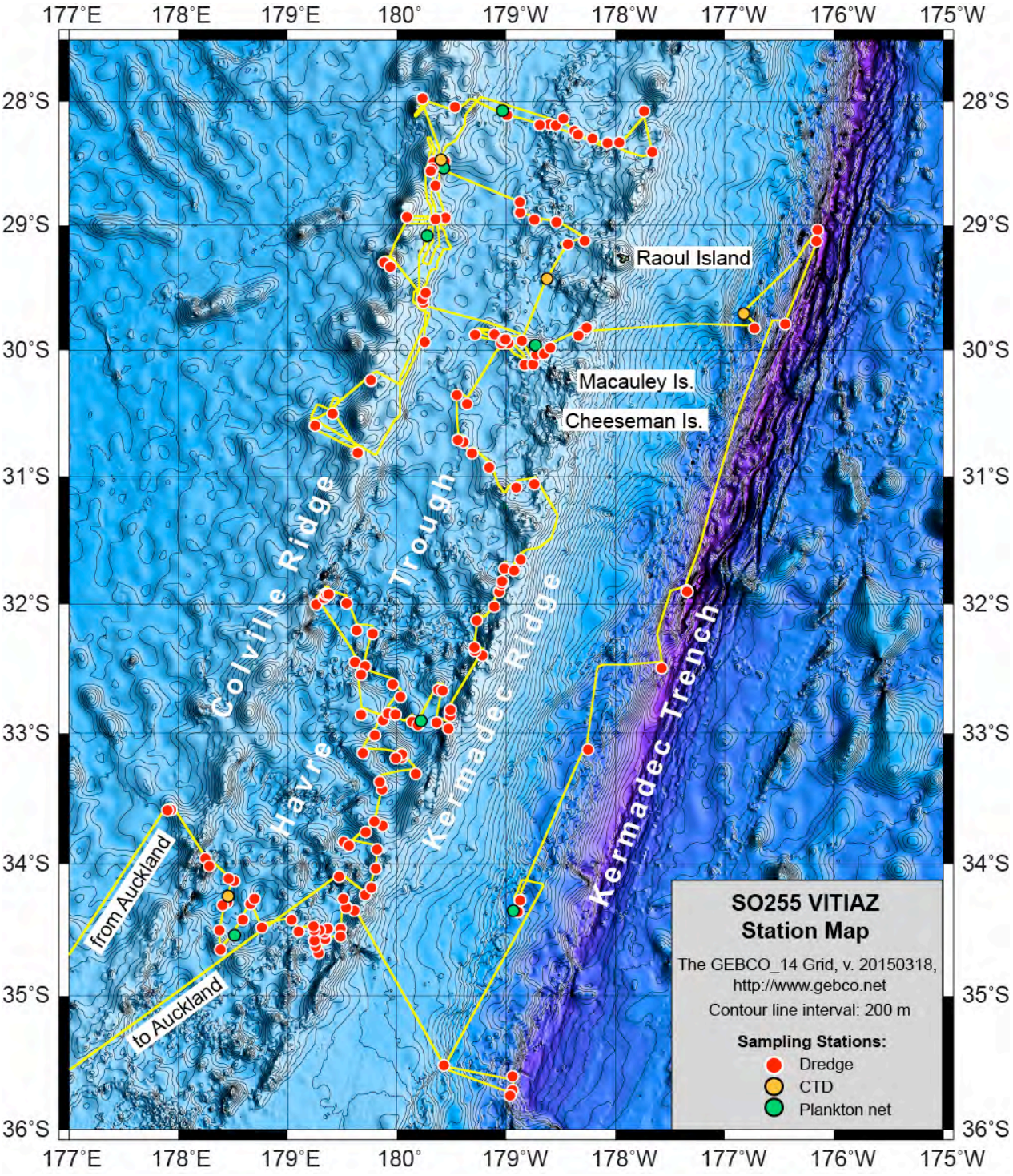

Fig. 3.14: Ship´s track and sampling stations (colored dots) of R/V SONNE cruise SO255 (data base for bathymetry: The GEBCO_2014 Grid, version 20150318, http://www.gebco.net).

4. AIMS OF THE CRUISE

(K. Hoernle, C. Timm, S. Endres, D. Wall-Palmer, R. Werner, F. Hauff, J. Gill)

4.1 PROFILING AND ROCK SAMPLING

Increasing international interest is drawn to the initiation and evolution of the older Vitiaz Arc of New Zealand, which split to form the Kermadec and Colville Ridges, that gave rise to the presently active Kermadec Arc and the Havre Trough Backarc systems. In collaboration with New Zealandic, Japanese, and U.S. American colleagues, R/V Sonne cruise SO255 conducted extensive bathymetric mapping (Kongsberg EM122 and EM710), sub-bottom profiling (Atlas Parasound DS P70), and hard-rock sampling (via dredging) to investigate physical and chemical conditions that control the development of subduction zones, including subduction initiation, evolution of mature arc systems, and the transition from arc splitting to backarc basin generation. More specific scientific questions of SO255 include:

I. Arc Initiation (Kermadec Ridge: eastern and western margins):

1) Did the southern Vitiaz Arc initiation occur during the Pacific-wide plate tectonic reorganization between c. 52-47 Ma in which Tonga and Izu-Bonin-Marianas (IBM), and possibly Kurile and Aleutian, Arcs and the Hawaiian-Emperor bend formed. If so, this was a subduction initiation event of major proportions with potential global impact on the oceans and the creation of continental crust in the oceans. Alternatively, did the Vitiaz-Tonga-Kermadec subduction system begin in the north and progressively open southwards possibly into the Oligocene and/or Early Miocene? Answering these questions will contribute to understanding the magnitude of the Early Eocene plate tectonic event.
2) Were similar distinctive magma types (MORB-type tholeiites, boninites and arc tholeiites and calc-alkaline compositions) formed at the initiation of the southern Vitiaz Arc as throughout the Izu-Bonin-Marianas system and in the Fiji-Lau system? If similar magma types are present, do they occur sequentially or contemporaneously? What implications are there for arc initiation processes?
3) How long did it take after arc initiation before “normal” arc-type magmas were produced? The Kermadec Ridge provides an opportunity not available in IBM or Tonga to sample deep (old) arc basement BOTH on the trench wall AND ~20 km away from the plate boundary at the 4,000 m high west wall of the Kermadec Ridge.

II. Arc Evolution (Colville and Kermadec Ridges and Havre Trough floor):

1) Does the Fiji/Lau Ridge geochemical evolution model apply to the evolution of the Colville Ridge? It is important to establish if this model has large-scale significance or if there are major differences within a single arc system.
2) Can the timing (not well-constrained at c. 6 Ma) and geochemical evolution preceding arc splitting be constrained better? If so, what does the petrology and geochemistry of arc magmatism tell us about the interplay of mantle convection and melting processes during arc breakup? Was arc splitting preceded by a major along-arc increase in slab fluid flux?
3) In oceanic arcs, reararc magmatism is more similar to average continental crust than volcanic front magmatism and is the rationale for drilling the Izu reararc (IODP Leg 350) soon. The western side of the Colville Ridge represents todays Kermadec reararc. Seamount chains extend west into the South Fiji Basin, similar to seamount chains west of the Izu and Mariana Arcs that are interpreted as having more slab-melt component. Thus Colville Ridge provides the opportunity to evaluate the role of deep slab melts in crustal evolution free from potential crustal-level contamination that often complicates interpretation of the slab signal.

III. Backarc Basin Formation (Havre Trough):

1) Rifting an arc differs geodynamically from rifting a continent because the crust is thinner and the mantle is wetter. Comparing the two regimes may clarify rifting mechanisms in general.
2) During the rifting stage, there is a change from corner flow in the mantle wedge of a subduction zone to focused mantle flow beneath a spreading center. This is an essential

but thus-far poorly studied stage in the evolution of arcs and backarc basins. It has been modeled numerically in 2D (Lin et al., 2010) but 3D is beyond current modeling capability, and the chronological and magmatic constraints on models are absent.

3) Will sampling of the chains of large volcanoes and isolated flows in the basins in the Havre Trough confirm the “hot fingers” model, in which the volcanic ridges contain a well-developed slab signature, whereas it is largely absent from the lavas formed in the deeper basins?
4) Is exposed volcanic rock foundered old arc or young (BABB or arc-like)?
5) Can “disorganized spreading” pave most of the basin with <1 Ma rocks, or even create 5-10 km-thick, <5 Ma “oceanic crust” without conventional ocean-ridge surface morphology or magnetic fabric?
6) Is the Havre Trough a new kind of spreading that characterizes decompression of wet mantle?

Integration of the results of these studies with those of previous and ongoing investigations (e.g. SO249 BERING, GeoPRISMS initiative) will substantially improve our understanding of the magmatic and tectonic evolution of arc systems in general. This is not only an important topic in basic research contributing to a better understanding of the Earth system but also provides important data for an assessment of natural hazards caused by subduction systems (volcanism, earthquakes, slope failure etc.).

4.2 ZOOPLANKTON SAMPLING

The primary aim of the zooplankton sampling was to collect planktonic gastropod specimens for morphological and molecular analysis. This is necessary to understand the taxonomy, biogeography and evolution of planktonic gastropods, which are currently threatened by ocean changes.

There were three secondary aims, all based on the investigation of atlantid heteropods. These aims were to develop methods of maintaining atlantid heteropods in laboratory conditions, to record observations of atlantid behaviour, and to conduct pilot ocean acidification studies on atlantids. These investigations and observations will be built upon in future research.

Sediment samples containing the shells of planktonic organisms were also collected to investigate the (recent) fossil assemblage of planktonic gastropods in this region.

4.3 BIOLOGICAL OCEANOGRAPHY

The photosynthetic activity of marine phytoplankton transforms inorganic carbon to organic matter (OM). The majority of the organic carbon that is produced during photosynthesis is released as dissolved organic matter (DOM) to the surrounding seawater (Benner 2002; Hedges 2002).

With 662 Gt C, marine DOM is a large carbon reservoir, approximately 200 times larger than the marine biota pool and equaling the size of the atmospheric CO2 pool (Hansell et al. 2009). DOM is a broad mixture of various compounds and its molecular composition is mostly uncharacterized. Photosynthetic products (polysaccharides, proteins, and nucleic acids chains) coagulate and aggregate, forming eventually gel particles (Alldredge et al. 1993; Passow 2002a; Passow 2002b). They represent important microbial habitats and comprise significant fractions of particulate extracellular carbon and nitrogen. Heterotrophic bacterial activity can remineralize about 50% of primary production in the surface ocean (Williams 2000; Robinson 2008).

DOM can be classified into different fractions by its reactivity or biological availability, respectively (Hansell et al. 2012). With increasing age, microbial degradation alters DOM to smaller and chemically more complex compounds (Benner and Amon 2015). Over time, an unneglectable fraction of the DOM pool is exported to the deep ocean via vertical mixing (Hansell et al. 2009). This older DOM is therefore less bioavailable (=refractory) for microbes than fresh surface organic matter. More than 75% of the marine DOM pool is localized in depths greater than 1,000 m (Hansell et al. 2009). While dissolved organic carbon (DOC) concentrations in the surface ocean decrease from ~80 µmol kg-1 to ~45 µmol kg-1 at 1,000 m, they stay invariant onwards (Hansell and Carlson 2015), thus deep sea DOM was historically considered as refractory. Recently, highly sensitive measurements could show that deep sea DOC decreases along the thermohaline circulation path by 29% (Hansell and Carlson 2013). This relatively strong gradient indicates that deep sea DOM is reworked, albeit turn-over is slow and

occurs over timescales of centuries to millennia (Hansell et al. 2012). The main sink for marine DOM in the deep sea is microbial consumption (Arístegui et al. 2009). This project aims to resolve what controls bacterial turnover of supposed refractory DOM in the deep sea.

The surface water in the Kermadec region is oligotrophic, subtropical water delivered from the South Pacific subtropical gyre (Chiswell et al. 2015). Primary productivity in this region is relatively low and chlorophyll a concentrations vary from 0.06 mg m-3 to 0.25 mg m-3 (Sutton et al. 2012). Intermediate waters, at 500-1,300 m depth, are mostly Antarctic Intermediate Waters, flowing south along the Kermadec ridge, while at depth Lower Circumpolar Deep Water is flowing equatorward (Chiswell et al. 2015).

5. AGENDA OF THE CRUISE

(R. Werner, K. Hoernle, C. Timm)

To achieve the scientific goals of the VITIAZ project, cruise SO255 should conduct systematic multi-beam mapping and hardrock sampling by dredging in the Havre Hrough and the Kermadec Fore Arc as well as along the Colville and Kermadec Ridges (Fig. 5.1).

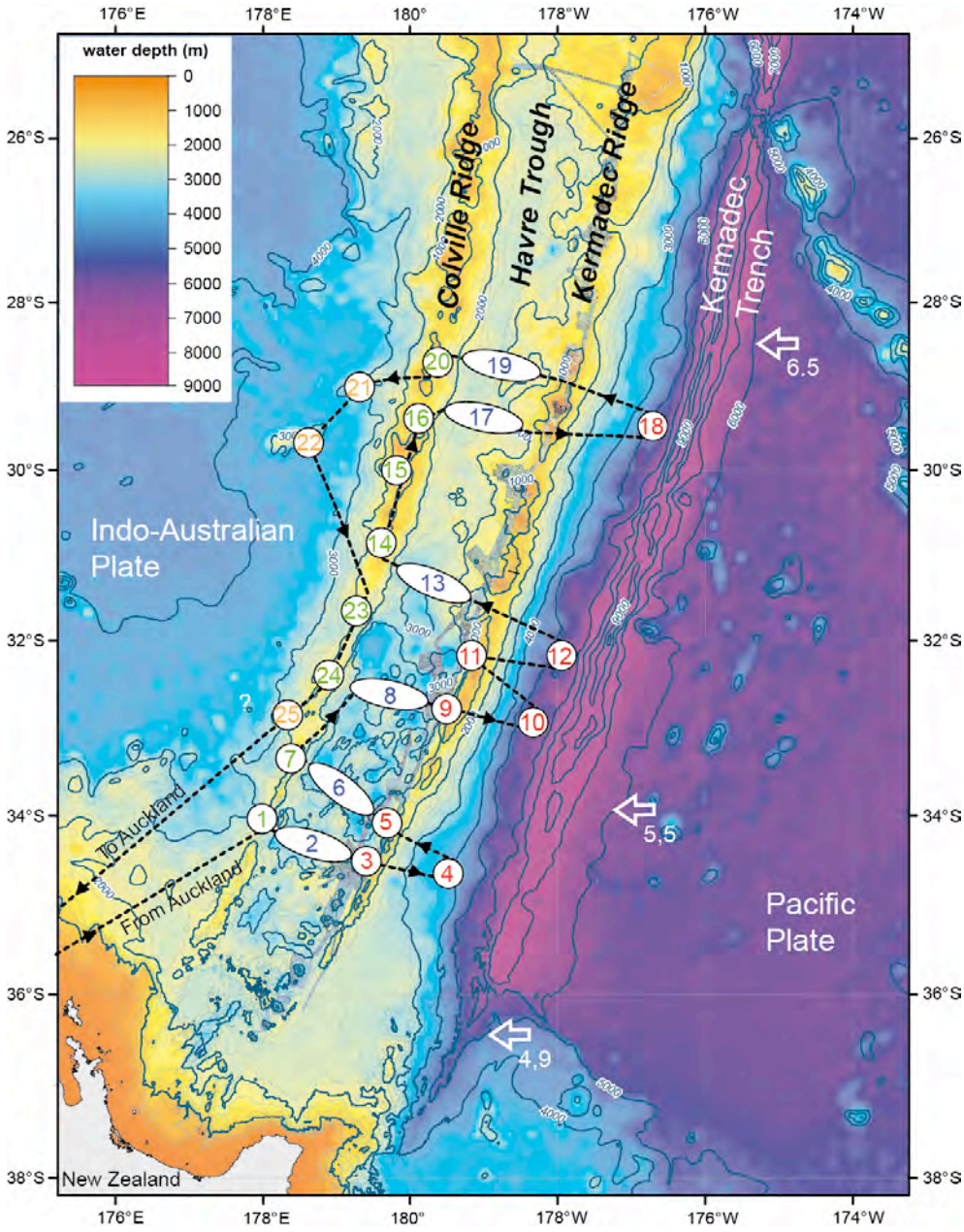

Fig. 5.1: Overview map based satellite altimetry showing the working area and the general sampling strategy of the SO255 VITIAZ cruise. The black dashed line represents the planned cruise track with numbers representing possible key stations (red - stations at Kermadec Ridge and Fore Arc; blue - Havre Trough profiles; green - Colville Ridge; orange - seamounts west of Colville Ridge). White arrows mark the subduction velocity after DeMets et al. (1994). Depth interval of bold contour lines is 1,000 m.

Kermadec Ridge and Fore Arc (Subduction Initiation; red numbers in Fig 5.1)

The Kermadec ridge is the only geologic feature within the Vitiaz-Kermadec arc system that provides access to the deepest and thus most likely oldest parts of the arc system, both on the eastern trench side, extending to depths >9,000 m b.s.l., and on the western side of the ridge. Unique to the Kermadec Ridge is that the western, rifted margin, with scarps of >2,000 m high

extending into water depths of ≥4,000 m b.s.l., exposing the 'inside' of the early arc. These scarps are separated from the Quaternary volcanoes by a deep basin and, therefore, are not buried by thick, young sediments and are most likely not affected by a geochemical overprint through younger volcanism. Sampling of the deep western margin therefore allows us to minimize the influence of the recent volcanic activity from the Kermadec stratovolcanoes where they are located on the ridge. We planned to dredge the Kermadec fore arc at several sites to depths of >6,000 m b.s.l. on the eastern Kermadec Ridge (western trench wall), as has been done in the Tonga arc at ~25˚S, where rocks related to subduction initiation were successfully recovered (Meffre et al., 2012). The west wall of the Kermadec Ridge should be sampled to depths of 4,000 m b.s.l.. Sampling at different latitudes in between the latitudes of arc front volcanoes assures good coverage along the Kermadec Ridge at a maximum distance from the influence of current volcanic activity. The latitudinal spread of the sampling sites will also allow us to test if the Kermadec part of the Vitiaz Arc initiated at 52-50 Ma similar to Tonga and IBM Arcs or if there is southward younging of subduction initiation, e.g. as proposed by Herzer et al. (2011). In our complementary project "BERING", one of the major goals is to evaluate if the Aleutian Arc also initiated at 52-50 Ma, complimentary to a major goal of this proposal. Together these projects will allow us to evaluate if subduction initiation at 52-50 Ma, possibly coupled with the collision of the Indian micro-continent with Asia, is a general feature of western and northern Pacific arc volcanism.

Colville Ridge (Vitiaz Arc Evolution; green and orange numbers in Fig 5.1)

As the Colville Ridge morphology is largely unknown north of 33°30´S, detailed profiling was required up to 29˚S to determine the structure of the ridge, which may provide clues as to the splitting of the arc and backarc basin formation, and to ensure that the best sampling targets are identified. To understand the evolution of the Vitiaz Arc, we planned to sample the magmatic basement of the Colville Ridge at several sites at different latitudes south of 29˚S to cover the changes in morphology along the ridge and identify possible temporal and spatial variations in geochemistry along the former Vitiaz arc. Comprehensive $^{40}Ar/^{39}Ar$ age dating, major, trace element and Sr, Nd, Hf and Pb isotope analyses will be used to trace the evolution of the mantle wedge through comparison with the magmatic products of the modern Kermadec Arc. New age information of the Colville and Kermadec Ridges will not only help to better constrain the splitting of the Vitiaz Arc and formation of the Havre Trough Backarc, but will also provide important information about the geochemical evolution of the Vitiaz Arc and its role in the formation of the south Fiji basin. Mapping and sampling of some seamounts located in the South Fiji Basin west of the Colville Ridge should help determine the extent of volcanism and possibly also the role of slab melts in the formation of continental crust.

Havre Trough (Backarc Basin Formation; blue numbers in Fig 5.1)

Detailed surveys and rock sampling along at least six profiles at different latitudes between 28°S and 35°S across the Havre Trough from the Colville to the Kermadec Ridges was planned to improve our understanding of 1) the opening history of the Havre Trough, 2) to characterize the variable styles of back-arc extension, and 3) the spatial and temporal geochemical evolution of Havre Trough volcanism and the composition of the mantle source. In particular, we will test if the difference in chemical composition between the stratovolcanoes and the basin floor volcanics show systematic differences in geochemistry with the stratovolcanoes having an arc signature, whereas the basin volcanics having more MORB-type geochemistry. If this difference holds up, it would support the hot fingers model (Tamura et al. 2002), proposed to explain the presence of the chains of stratovolcanic-like structures. Sampling of fault-bounded blocks (possible remnants of the Vitiaz Arc) may also help reconstruct the temporal and spatial geochemical evolution of the Vitiaz Arc preceding arc splitting.

The working areas discussed above have been selected in coordination with our New Zealandic and U.S. partners based on the available multi-beam data and data sets such as Etopo (Smith and Sandwell, 1997) and GEBCO (http://www.gebco.net). The selection of single dredge tracks, however, crucially depended on detailed multi-beam profiling conducted on the cruise. Additional factors influencing station selection were the quality of the material obtained through earlier dredge hauls in the area. Therefore the exact localities of the dredge sites have been chosen during the cruise. Extensive multi-beam mapping was also conducted to identify different geomorphological units and structures, and stages of volcanic activity.

6. BRIEF INTRODUCTION INTO THE WORKING AREA

(K. Hoernle, J. Gill, Y. Tamura, E. Todd)

6.1 GEODYNAMIC OVERVIEW

Subduction systems represent zones of plate convergence where one plate sinks beneath another into the mantle, resulting in the formation of a magmatic arc. Oceanic arcs offer the opportunity to study these processes with minimal contamination from the crust through which magmas ascend. Although extensive studies have been carried out about the nature and causes of spatial variations along and across modern oceanic arcs, little is known about the initiation of subduction, the temporal evolution of arc magmas, and the spatial and temporal pattern of magmatism that accompanies the initial stages of arc rupture to form back arc basins. These three topics motivated SO255 to study the Vitiaz Arc in the southwest Pacific.

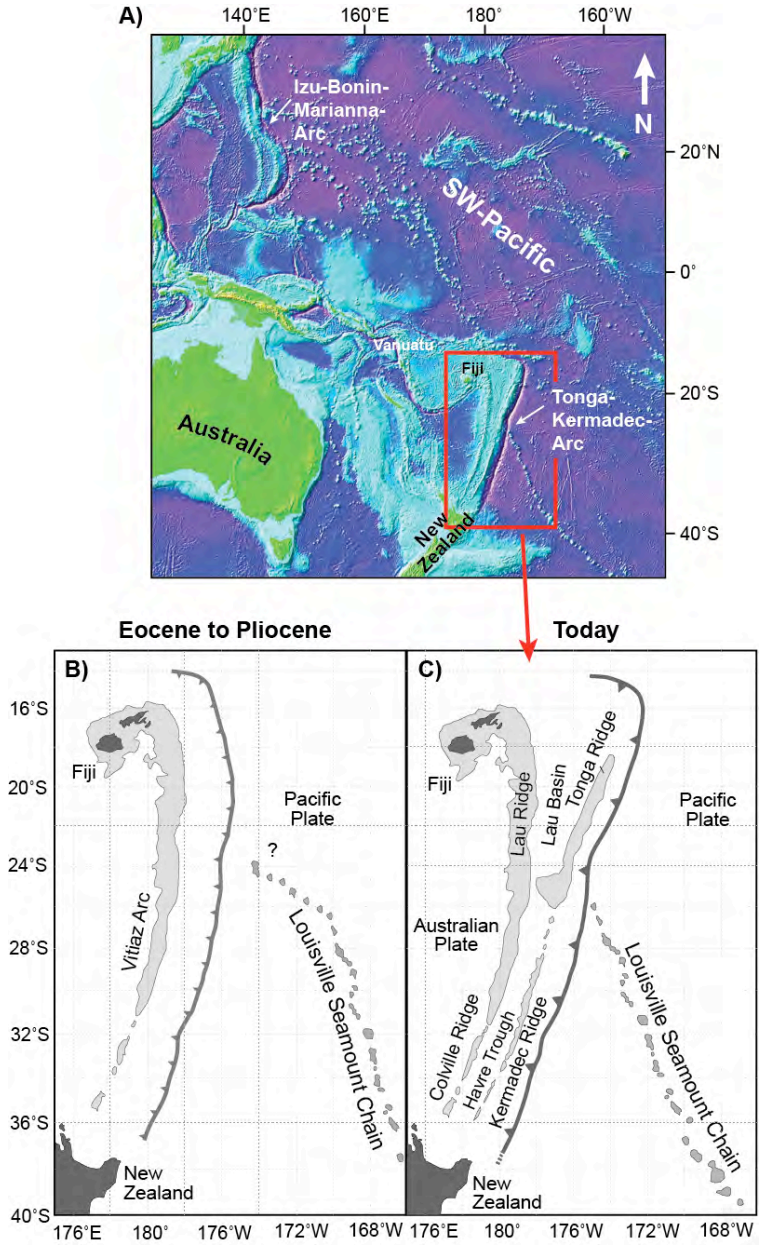

Fig. 6.1: (A) Overview maps of the SW-Pacific with the major arc systems, **(B)** the ancient Vitiaz Arc and **(C)** the present Tonga-Kermadec Arc system (B and C after Ruellan et al. 2003, modified).

The Vitiaz Arc refers to what are now Vanuatu, the Lau-Colville Ridge that includes Fiji, and the Tonga-Kermadec Ridge, the latter two extending south to New Zealand (Fig. 6.1). Their inferred previous unity was named the Vitiaz Arc (Gill and Gorton, 1973) after a USSR research vessel that discovered the “Vitiaz Trench” between northern Vanuatu and Samoa in the 1960s

(Fig. 6.1). The inferred Vitiaz Arc may have been part of a continuous west-dipping subduction system that extended from New Guinea to New Zealand at the eastern edge of the Indian Plate.

6.2 GEOLOGICAL AND GEOCHEMICAL EVOLUTION OF THE TONGA-KERMADEC AND LAU-COLVILLE RIDGES AS PART OF THE VITIAZ ARC

Subduction initiation has been studied most in the Izu-Bonin-Marianas (IBM, Fig. 1) arc (Reagan et al. 2010, 2013; Ishizuka et al. 2011), where it has been shown that subduction started at ~52-50 Ma as a consequence of a Pacific-wide tectonic reorganization, leading to a change in plate motion. Consequently, one objective of SO255 was to discover the age of subduction initiation, and the chemical evolution of arc volcanism, in the paired Tonga-Kermadec and Lau-Colville Ridges that extend ~2,500 km north from the North Island, New Zealand.

In Tonga, ages of 47-52 Ma have been obtained on rocks from the island of ‘Eua (e.g., Ewart et al. 1977; Duncan et al. 1985; Todd et al. 2012) and dredged from the Tonga forearc (Meffre et al. 2012), providing a minimum age for subduction initiation. Meffre et al. (2012) found peridotites at the base of the forearc (6,000-9,000 m depth), followed by gabbros and dolerites (4,500-6,000 m), which are in turn overlain at <4,500m by 52-49 Ma old tholeiites (equivalent to FABs). Todd et al. (2012) found similar rocks in Viti Levu Fiji and ‘Eua Tonga (Eua), including interbedded tholeiitic and boninitic lavas. Therefore, in at least the northern part of the Lau-Colville and Tonga-Kermadec Ridges, subduction seems to have started at about the same time as in IBM. But when did the Kermadec Arc initiate? Did it form as part of the 52-50 Ma plate tectonic reorganization that resulted in a change of Pacific plate motion, or did it form later as proposed by Herzer et al. (2011) or even in the Miocene (Bassett et al. 2016).

A distinctive feature of the Kermadec and Colville Ridges is the sudden change in their water depth and width at ~32°S. This puzzling change has been recognized by many authors and was called the Central Kermadec Discontinuity by Bassett et al. (2016), who considered it the geological terminus of the old Lau and Tonga Ridges (i.e., the Vitiaz Arc). The ridges between that discontinuity and New Zealand might be new arc crust created in the Miocene, and/or the narrow frontal arc complement to the Three Kings Rise remnant arc (Herzer et al. 2011; Bassett et al. 2016), or old Tonga arc crust that foundered due to subducting the Hikurangi Plateau (Davy and Collot 2000; Timm et al. 2014). Consequently, the oldest arc crust and the age of subduction initiation north of 32°S may be similar to that for Tonga, whereas it might be younger in the south.

Although arc volcanism is associated with plate convergence and, therefore compression, paradoxically it can be largely suspended for 5-10 m.y. when the arc is split by extension and associated sea floor spreading that initiates near the volcanic front, and results in a back arc basin with typical oceanic crustal thickness and morphology (Karig 1970; Taylor 1992). In general, this process of forming back-arc basins is thought to evolve from early rifting and thinning of older arc crust (e.g., Wright 1993; Parson and Wright 1996) to active seafloor spreading and the formation of new crust with typical oceanic thickness (Parson et al. 1990; Taylor et al. 1996). However, the critical initial “rifting” stage of this process, when the mantle wedge stretches and dehydrates before normal spreading starts, has not been well studied, and there is controversy about how much new crust is generated in this way versus merely attenuation of older arc crust. This stage is known in the western Lau Basin, northwestern North Fiji Basin, and northern Mariana Trough, but is best expressed in the Havre Trough. The Lau Basin and Havre Trough are the backarc basins complimentary to the Tonga-Kermadec Arc, respectively. Combined subduction velocities along the Tonga – Kermadec arc (i.e., subduction plus back-arc opening velocities) decrease from ~ 24 cm/yr (the fastest subduction on Earth) to ~5 cm/yr just north of New Zealand (e.g., DeMets et al. 1994). Accordingly the backarc opening velocity decreases from ~15.9 cm/yr in the northernmost Lau Basin to ~1.5 cm/yr in the southern Havre Trough region, leading to a zipper-like opening of the Lau Basin – Havre Trough back-arc system (Fig. 6.1). SO135 mapping and sampling at Valu Fa in the Lau Basin provides evidence that southward propagation of the East Lau Spreading Center ends at ~23˚S, giving way to rifting in the Havre Trough (e.g., Ruellan et al. 2003).

Crustal thickness of the Havre Trough varies from <10 to 15 km (Parson and Wright 1996; Flueh and Kopp 2007; Scherwarth et al. 2009; Scherwarth et al. 2010; Sutherland et al. 2010; Scherwarth et al. 2009; Basset et al. 2016). In contrast, the crustal thickness at the Eastern and Central Lau spreading centers is ~6km and ~8km, respectively (Crawford et al. 2003). Thus, the

Havre Trough crustal profile is thin relative to the Kermadec and Colville Ridges, yet is thicker than crust formed by seafloor spreading in the Lau Basin.

Only two radiometric ages older than Pleistocene have been reported from the southern ridges. A whole rock K-Ar age of 7.8 ± 0.6 Ma was obtained for a basalt clast dredged from the eastern flank of the Kermadec Ridge at ~7,700 m below sea level (b.s.l.) at 31˚36'S (Ballance et al. 1999). An Ar-Ar plateau age of 16.7 ± 0.1 ¬Ma was obtained from a basalt dredged from the Colville Ridge ~35˚S (Mortimer et al. 2010) from which a 5.4 ±0.1 Ma whole rock K-Ar age had been obtained previously (Adams et al. 1994). Biostratigraphic ages for sediments dredged from the Colville Ridge are Upper Miocene. Ar-Ar plateau ages for seven volcanic rocks from the southernmost Kermadec arc are <1 Ma (Wysoczanski et al. in prep).

Abundant geochemical data are available for the Quaternary Kermadec Arc front volcanoes that often are built on Havre Trough crust slightly west of the Kermadec Ridge (e.g., Brothers et al. 1967; Smith and Price 2006; Smith et al. 2009; Gamble et al.,1993, 1996, 1997; Haase et al. 2002, 2006, 2011, Turner et al. 1997; Ewart et al. 1998; Todd et al. 2010, 2011; Timm et al. 2011, 2012, 2014). In contrast, few data are available for pre-Pleistocene volcanic rocks from either ridge. A few low-K basaltic andesites of unknown age dredged from the Colville Ridge at 31 to 35°S have been analyzed, but comprehensive trace element and isotope data are published for only one of them (Mortimer et al. 2007; Handler et al. 2011; Todd et al. 2011). There is only one published analysis of a pre-Quaternary volcanic rock from the Kermadec Ridge itself (Wysoczanski et al. 2012).

A fundamental question relates to the formation of continental crust in arcs. In oceanic arcs, rear arc magmatism is closer in composition to average continental crust than volcanic front magmatism. This was the rationale for IODP Leg 350 drilling in the Izu rear arc in 2014. The Colville Ridge in general, and its western side in particular, was the Vitiaz rear arc. Seamount chains on the west side of the Colville Ridge extend into the South Fiji Basin, just as there are seamount chains west of the Izu and Mariana Arcs. Volcanic rocks in these seamounts are interpreted as having more slab-melt component. Thus the Colville Ridge provides the opportunity to evaluate the role of deep slab melts in crustal evolution free from potential crustal-level contamination that often complicates interpretation of the slab signal.

6.3 FORMATION AND EVOLUTION OF THE HAVRE TROUGH BACK ARC BASIN

Based on aeromagnetic anomalies, back-arc spreading was initially proposed for the Havre Trough by Malahoff et al. (1982). Caress (1991) also interprets the short (15-35 km long) en-echelon basins in the Havre Trough that lack sedimentary infill as being formed through active seafloor spreading similar to the Lau Basin. Wright (1993), however, argues that the tectonic configuration of the southern Havre Trough is more consistent with a process of backarc rifting than spreading, based on the occurrence of a segmented rift-graben system. Fresh (and presumably young) basalts were recovered in from one of the deep basins in the southernmost Havre Trough, which has been taken as evidence for active back-arc volcanism, but not spreading, in this region (e.g., Wright et al. 1996).

As with the Kermadec and Colville ridges, the bathymetry of the Havre Trough north of ~32˚S is significantly shallower (< 2,500 m) and less rugged consisting of horst and sediment filled graben structures, whereas the southern Havre Trough is significantly deeper (up to ~4,000 m) and has a more rugged morphology.

Detailed multi-beam mapping has been undertaken only locally within the northern Havre Trough between the southern tip of the Valu Fa Ridge and ~30˚S (Fujiwara et al. 2001), so the bathymetry is mostly inferred from satellite altimetry. SO135 and TAN1213 conducted detailed geophysical surveys and rock sampling across the Havre Trough between c. 30°00´S - 30°30´S (Stoffers et al. 1999). At 30˚00´S - 31˚20´S, SO135 and TAN1213 swath imagery and seismic profiling shows low to mid reflectivity and horizontal sedimentary layers, consistent with extensive sediment deposition, interrupted by high reflectivity areas mostly along the center of the grabens that have been interpreted as extrusive volcanic rock (Parson and Wright 1996; Stoffers et al. 1999). Further east, an eastern sub-basin between the Central High of the Havre Trough and the Kermadec Ridge is filled with a pervasively faulted sediment sequence, suggesting that the locus of present-day extension lies in the eastern half of the Havre Trough at this latitude and that extension has migrated eastwards through time, possibly following a retreating slab. The SO135 scientific team also found a systematic decrease in the thickness of

Mn-crusts from western to the eastern Havre Trough and attributes them to volcanism younging from west to east across the Havre Trough, but this has not been confirmed with age dating, and is contrasted by several seamounts across the southern Havre Trough at ~36˚S that all have Ar-Ar plateau ages ≤ 1 Ma (Wysoczanski et al. in prep).

The Havre Trough south of 32˚S, is morphologically characterized by abundant short-segment (80-140 km) arc-subparallel rift grabens that are often separated by roughly arc-perpendicular ridges of volcanic edifices. Many of the Havre Trough rift grabens are deep (>4000 mbsl), floored by extensive pillow mounds or ridges, and bounding fault scarps are often capped with linear pillow mounds parallel to the orientation of faults. Wysoczanski et al. (2010) demonstrated that the “rifting stage” in the Havre Trough is characterized by basin-and-range morphology, lack of good magnetic lineation, some large volcanoes (both isolated and in chains across the backarc), and many small volcanic seamounts. These features are also characteristic of the west (inactive) half of the Lau and North Fiji Basins, and the northern Mariana Trough. Using these observations, Wysoczanski et al. (2010) proposed that the Havre Trough is in an incipient state of "disorganized" spreading whereby 1) deep short-segment rift grabens are pull-apart basins floored by volcanism derived from decompression melting of upwelling mantle and 2) preexisting normal faults serve as the plumbing network for intrusive volcanism which, by progressive replacement of arc basement results in the accretion of new back-arc crust. To date, there have been no known Vitiaz basement rocks previously recovered from within the Havre Trough.

Morphological similarities between the southern Havre Trough and SE Lau Basin suggest both may have been formed by a similar process, and likely represent the transitional stage between rifting and spreading, potentially universal to all back-arc basins at this stage, modern and ancient. The Havre Trough may be the only oceanic backarc basin on Earth now in an early stage (pre-seafloor spreading stage) of backarc basin evolution.

Most samples recovered in the Havre Trough are basaltic, though a small number of andesite to rhyolite samples have been recovered 30 to 55 km behind the volcanic front in the southern Havre Trough. A subset of basalts from the Havre Trough have little to no components derived by subduction and, together with a subset of Miocene backarc basalts from the South Fiji Basin, are interpreted by Todd et al. (2011) as representing melts of the Vitiaz ambient mantle wedge (AMW), that have been unmodified by components from subduction of the Pacific plate. Of note, even these “unmodified” mantle melts are isotopically diverse (c.f., Woodhead et al. 2001), and form an array in Hf-Nd and Pb-Pb isotope space that projects towards a HIMU-like component similar to OIB-like Miocene seamounts in the South Fiji Basin (Mortimer et al. 2007; Todd et al. 2011). Alternatively it has been proposed that the HIMU-like signature may be derived from melts of the subducting Hikurangi Plateau (Timm et al. 2014).

The morphology of the southern Havre Trough seems to correlate with the styles of volcanism and lava geochemistry (Todd et al. 2010; Todd et al. 2011). Large edifices that sometimes form seamount chains orthogonal to the arc (Rumble V Ridge) and the rims of deep basins near the Kermadec Ridge (e.g., Rumble rift volcanoes) are similar in elemental and isotopic composition to the Kermadec Arc volcanic rocks (e.g. Gamble et al. 1993, 1996; Todd et al. 2010, 2011), which appear to contain a larger mass fraction of slab-derived fluids and melts. On the other hand, lava flows and small edifices on the floors of the deep grabens are more MORB-like, similar to “Back-Arc Basin Basalt” (BABB), with a small slab-derived fluid component (Wysoczanski et al. 2010, 2012; Todd et al., 2011, 2012). The contrast in compositions between the two groups has been interpreted as reflecting “hot fingers,’ or thermal anomalies in the mantle wedge and slab surface (Todd et al. 2011) in response to along-strike convection cells in the mantle wedge (e.g., Tamura et al. 2002; Honda and Yoshida 2005). In this model, “hot fingers” leave a thermal hand-print on the slab surface, resulting in constructional volcanoes derived from mantle that has been fluxed by slab melts rising through the ambient mantle wedge, whereas melts that floor the deep grabens have either no subduction component (i.e., like AMW) or a minor fluid-dominated one (i.e., Ngatoroirangi Rift). This may be the characteristic way that mantle flow beneath arcs (primarily corner flow) evolves to mantle flow beneath spreading centers (vertical upwelling and then lateral transport to both sides after from the spreading center). However, only a few areas, in particular the eastern side of the Havre Trough, have been mapped and sampled in detail, so the “hot fingers” model, which could be a

fundamental step in the transition from subduction zone to spreading type mantle convection, needs to be tested in other areas.

Previous studies of cross-arc changes in the chemistry of Havre lavas, focused primarily at the Rumble V Ridge cross-chain (~36˚S), suggest changes in both the subduction component and the degree of mantle fertility. The Rumble V Ridge is capped by young (<1Ma) volcanic rocks with arc-like, but diverse, basaltic compositions, and is a rare known example of nominally contemporaneous lavas erupted at a range of distances to the volcanic front (15-80 km) and depths to the slab surface (150 to >300 km). The chemistry and Hf isotope ratios of these rocks suggest that they come from the melting of mantle that is progressively more depleted towards the volcanic front, consistent with continuous melt extraction from trenchward-convecting mantle, similar to trends in rear-arc to volcanic-front magmas at the Izu-Bonin arc (Hochstaedter er al., 2000). The arc-like component added to this variably depleted mantle also seems to change with distance to the volcanic front. Todd et al. (2010) proposed that a down-dip gradient of different slab-derived components added vertically to the overlying mantle wedge reflect the transition from dehydration to melting, and the appearance or disappearance of trace mineral phases (esp. zircon, monazite, rutile) from a slab surface undergoing progressively higher grades of metamorphism. The across-arc trend, if also observed and constrained at different locations within the Havre Trough, especially in the northern Havre Trough where thicker crust has been proposed (Bassett et al. 2016), would be extremely important to understanding the "post-volcanic front" mass transfer of material from the slab to the mantle, and of the metasomatic conditioning that subducted oceanic crust undergoes as a part of the global crustal recycling process.

7. METHODS AND DESCRIPTION OF STATIONS

7.1 PROFILING AND ROCK SAMPLING

7.1.1 Methods

(R. Werner, F. Hauff, M. Jutzeler, W. Borchert)

7.1.1.1 Bathymetry (Kongsberg Maritime EM122 and EM710)

Data Acquisition

R/V SONNE is equipped with Kongsberg Maritime EM122 and EM710 multi-beam echo sounder systems for continuous mapping of the seafloor. The systems consist of several units. A transmitter/receiver transducer array is fixed in a mills cross below the keel of the vessel. A preamplifier unit contains the preamplifiers for the received signals. The transceiver unit contains the transmitter and receiver electronics a nd processors for beam-forming and control of all parameters with respect to gain, ping rate and transmit angles. The system has serial interfaces for vessel motion sensors, such as roll, pitch and heave, external clock and vessel position. The systems also include high performance PC workstations. The operator software is the Seafloor Information System (SIS) running under Windows XP or Win7, which processes the collected data, applying corrections, displays the results and logs the data to internal or external disks.

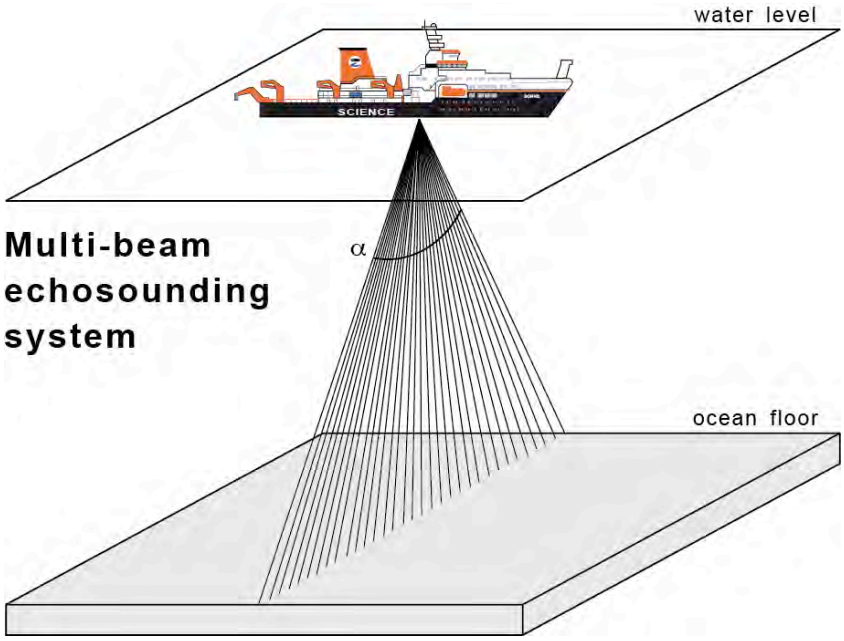

Fig. 7.1: Schematic sketch illustrating the principle mode of operation of multi-beam echo-sounding systems. The whole angular coverage sector (α) of the Kongsberg EM 122 system amounts is up to 150°.

The EM122 system uses a frequency of about 12 KHz with a whole angular coverage sector of up to 150° (75° per port-/starboard side, Fig 7.1). The depth range amounts to 20 - 11,000 m. The system has up to 288 beams and 432 soundings, respectively, per swath with pointing angles automatically adjusted according to achievable coverage or operator defined limits. The ping-rate depends on the water depth and the runtime of the signal through the water column. The variation of angular coverage sector and beam pointing angles was set automatically. This optimizes the number of usable beams. During a survey the transmitter fan is split into individual sectors with independent active steering according to vessel roll, pitch and yaw. This forces all soundings on a line perpendicular to the survey line and enables a continuous sampling with a complete coverage. Pitch and yaw movements within ±10 degrees and roll movements within ±15 degrees are automatically compensated by the software. Thus, the EM122 system can map the seafloor with a swath width about up to six times the water

depth (to approximately 30 km). The geometric resolution depends on the water depth and the used angular coverage sector and is less than 10 m at depths of 2,000 - 3,000 m.

The higher frequency multi-beam echo sounder EM710 operates at sonar frequencies in the 70 to 100 kHz range with a whole angular coverage sector of up to 140°. The minimum acquisition depth is from less than 3 m below its transducers, and the maximum acquisition depth is up to 2,000 m. The number of beams are 256 or 128, respectively, with dynamic focusing employed in the near field. The distribution pattern may be set to be either equiangular or equidistant. All receive beams are electronically roll stabilized. High density beam processing mode provides up to 400 or 200 soundings per swath by using a limited range window for the detections, which in practice is equivalent to synthetically sharpening the beam width. The cross track coverage (swath width) is up to 5.5 times water depth to a maximum of more than 2,000 m. Combined with the EM 122, the EM 710 will provide a total system solution that meets the strictest IHO (International Hydrographic Organization) requirements for all water depths.

The accuracy of the depth data obtained from the system is usually critically dependent upon weather conditions and the use of a correct sound velocity profile. During SO255 two sound profiles has been determined using a CTD ensuring the use of the correct sound velocity on this cruise. The first sound profile has been measured at the beginning of the cruisein the southern end of the working area, the second CTD has been deployed in the northern section of the working area in the central Havre Trough (see Appendix I).

Data Cleaning and Processing

The data cleaning procedure was accomplished by the QPS Qimera V. 1.4 software. After loading the raw data (.all files) from the EM122 and EM710, respectively, and the correct sound velocity profile, a first filtering of failed beams has been conducted. Subsequently a dynamic surface has been created showing the ship´s track and the raw data (Fig. 7.2).

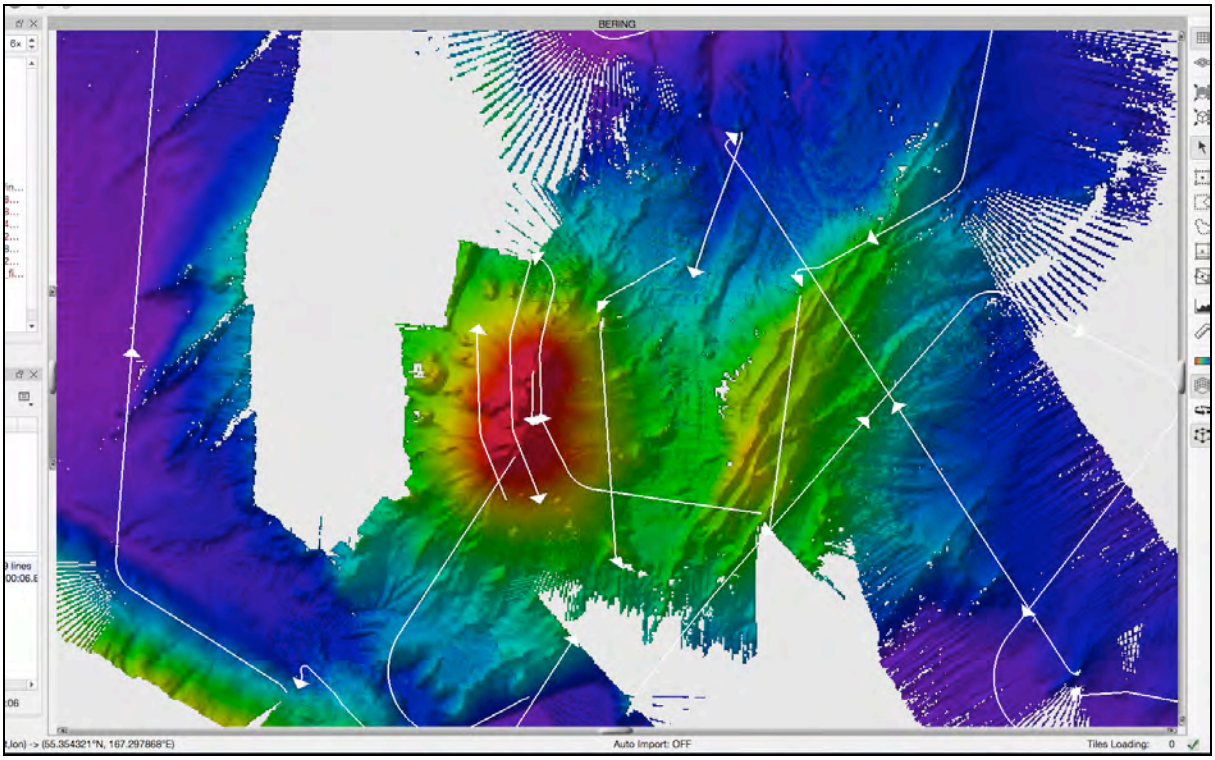

Fig. 7.2: Dynamic surface created with Qimera V 1.4 showing the raw data and the ship´s track.

Qimera allows an automatic elimination of major erratic data points using a spine filter. Furthermore there are several tools for detailed elimination of erratic data points, for example a swatch editor, a 2D editor or a 3D editor (Fig. 7.3) which all enable the operator the process each single beam stepwise. All editors display not only the cleaned data but also, if desired, the rejected data points and offer a variety of visualizations of the data (according to files,

depth, intensity etc.). Additionally the data can be cleaned and edited using CUBE (Combined Uncertainty and Bathymetry Estimator, by University of New Hamshire).

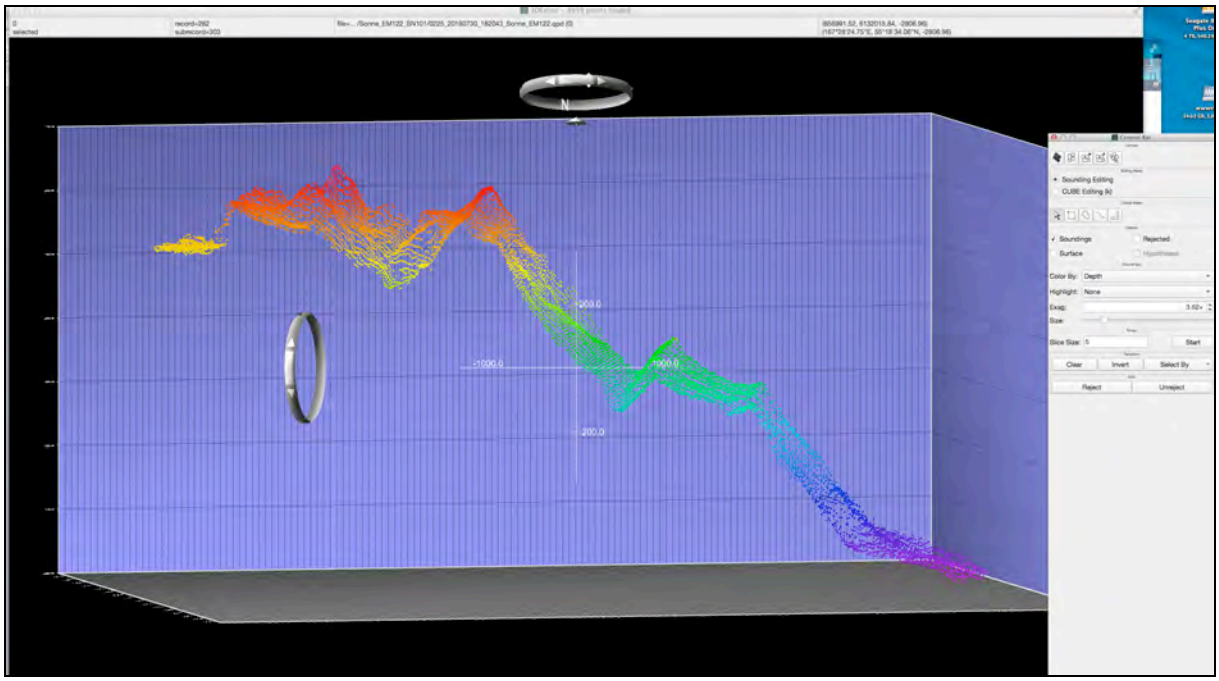

Fig. 7.3: 3D editor of Qimera V 1.4.

After data cleaning a static surface has been generated from the dynamic surface, creating a .sd file which can be loaded in the QPS Fledermaus software, allowing 3D visualization of the cleaned data (see chapter 7.1.2). Furthermore the data can be exported in an ASCII x,y,z file format with header information for assembling, gridding and contouring with the GMT software (Wessel and Smith 1995). All this work was done by the system operators of R/V SONNE.

7.1.1.2 Sediment Echo-Sounding (Atlas PARASOUND P70)

Sub-bottom profilers (or sediment echo-sounding systems) are used to display sub-seafloor geological structures as, for example, marine sediment successions. The ATLAS PARASOUND sub-bottom profiler acts as a low-frequency sediment echo-sounder and as high-frequency narrow-beam sounder to determine the water depth. The sub-bottom profiler is based on the parametric effect, which is produced by additional frequencies through nonlinear acoustic interaction of finite amplitude waves. In principle, if two sound waves of similar frequencies (18 kHz and e.g. 22 kHz) are emitted simultaneously, a signal of the difference frequency (e.g. Secondary Low Frequency of 4 kHz) is generated for sufficiently high primary amplitudes. This new component is traveling within the emission cone of the original high frequency waves, which are limited to an angle of only 4.5° for the equipment used (Fig. 7.4). The resulting footprint size of only 7% of the water depth is much smaller than for conventional systems and both vertical and lateral resolution is significantly improved.

The ATLAS PARASOUND system is permanently installed on R/V SONNE. The hull-mounted transducer array has 128 elements within an area of 1 m^2. It requires up to 70 kW of electric power due to the low degree of efficiency of the parametric effect. The PARASOUND sub-bottom profiler on R/V SONNE is equipped with the digital data acquisition software from ATLAS Hydrographic, which is subdivided in ATLAS Parastore and ATLAS Hydromap Control. ATLAS Parastore allows the buffering, transfer and storage as well as the visualization of the digital echograms at very high repetition rates. ATLAS Hydromap Control is responsible for user defined modifications of the system (e.g. pulse rate or mode) and supports the operator in running the system properly.

PARASOUND data have been recorded during all SO255 bathymetric surveys. During the cruise, however, only online profiles displayed on the screen have been used to identify

tectonic features. The data acquisition included PHF and SLF data. All data have been copied on an external hard disk and sorted by the operator into folders according to data type (PHF, SLF / ASD, PS3, SEGY) and recording dates (0 to 24 hours UTC). After the cruise the entire PARASOUND data set will be transferred to data co-operating specialists for further shore based processing and analyses and is archived in international data banks.

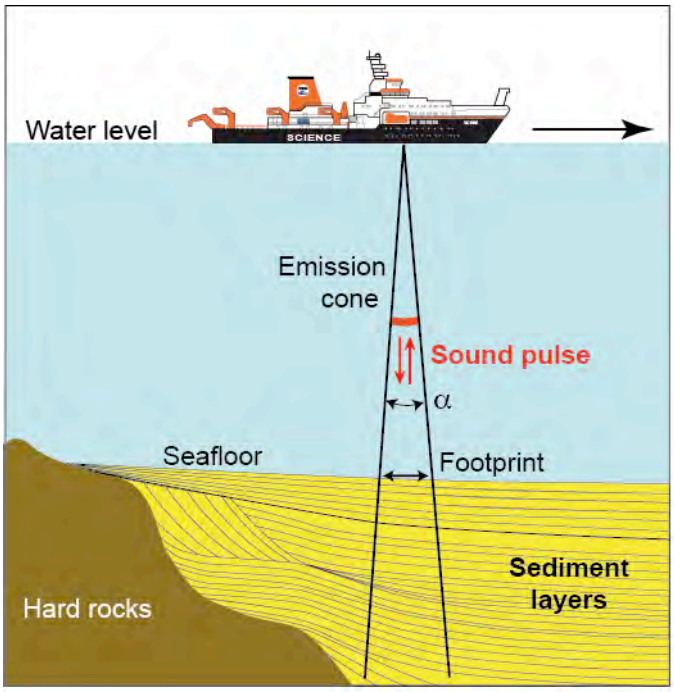

Fig. 7.4: Schematic sketch illustrating the principle mode of operation of sub-bottom profilers. The extremely narrowed beam of the ATLAS PARASOUND system of 4.5° (α) allows to resolve even small-scale bottom structures and offers a deeper penetration of up to ~200 m into the seafloor.

7.1.1.3 Dredging, Site Selection, and Laboratory Work

Rock sampling on SO255 was carried out using rectangular chain bag dredges. Chain bag dredges are similar to large buckets with a chain bag attached to their bottom and steel teeth at their openings, which are dragged along the ocean floor by the ship´s winch.

General station areas were chosen on the basis of a number of existing datasets. These mainly include predicted bathymetry, derived from gravity data and ship depth soundings (etopo by Smith and Sandwell [1997] and "The GEBCO_2014 Grid, version 20150318", http://www.gebco.net), published data, maps, and profiles as well as unpublished data and information kindly provided by our New Zealandic and U.S. American colleagues.

The selection of dredge stations in the southern part of the working area was mainly based on a new, unpublished multi-beam data set kindly provided by GNS. These new data allowed us to sample more sites than originally planned because we could forbear from doing extensive bathymetric surveys before dredging in that area. The final selection of dredge sites in the largely unmapped northern working area, however, was critically dependent on detailed multi-beam echo-sounding surveys carried out at each site before dredging. Final positioning of the vessel over the dredge station was based on the bathymetric data including considerations of wind, swell and drift conditions. Dredge tracks were usually located - depending on the morphology of the structures - on steep slopes, at plateau edges, at scarps, canyon walls, fracture zones, and on the flanks of cones, ridges, and larger seamounts. This was mainly done to avoid areas of thick sediment cover.

Shipboard Procedure

Once onboard, all rocks collected with the dredge were first scanned for encrusting benthic invertebrates. Afterwards a selection of the rocks were cleaned and cut using a rock saw. They were then examined with a hand lens and microscope, and grouped according to their lithologies and degree of submarine weathering. The immediate aim was to determine whether material suitable for geochemistry and radiometric age dating had been recovered. Best suitable samples have an unweathered and unaltered groundmass, empty vesicles, glassy rims (ideally), and any phenocrysts that are fresh. If suitable samples were present, the ship moved to the next station. If they were not, then the importance of obtaining samples from the station was weighted against the available time.

Fresh blocks of representative samples were then cut for post-cruise thin section and microprobe preparation, geochemistry and further procedures to remove manganese and alteration products and/or to extract glass (if applicable). Each of these sub-samples, together with any remaining bulk sample, was described, labeled, and finally sealed in either plastic bags or bubble wrap for transportation to GEOMAR or cooperating institutions. The biological samples (mainly benthic invertebrates) were fixed on board in cold 100% ethanol and will be further processed and archived at the Museum für Naturkunde Berlin. Additionally bulk surface sediment was sampled at most stations from the sediment traps installed in the dredges being in particular relevant for volcanological and sedimentological (see below) as well as plankton studies (see chapter 7.2).

Three sampling strategies were carried out for volcanology and sedimentology purposes. Samples were taken at all possible dredges. The sample tag name for all volcanology samples is “ML” (e.g., SO255-ML-180).

(1) Shape analysis. Pumice clasts were washed, and their shape photographed at high resolution, using an EOS 70D camera. Only clasts that had not been broken by the dredge were selected, and each clast had two faces photographed.
(2) Sampling of coarse pumice clasts for geochemical and vesicularity analyses. A representative suite of pumice clasts was selected upon general aspect, colour, vesicularity, and shape. Pumice were washed, and dried at 120°C for at least 24 hours.
(3) The dredge apparatus includes four 30-cm-long, 2-inch wide sediment traps that efficiently sampled seafloor sediment at most dredges. The sediment was transferred into a bucket, and ca. 50 cm^3 of representative sample was immediately selected for further grain size and componentry analyses. The remaining of the sediment was sieved at 0 phi (1 mm) to collect pumice clasts. All clasts and sediment were dried at 60°C for 24 hours.

Shore Based Analyses

Magmatic rocks sampled by R/V SONNE from the ocean floor will be analyzed using a variety of different geochemical methods:

Ages will be determined by $^{40}Ar/^{39}Ar$ laser step-heating dating and U-Pb zircon dating. Major element geochemistry by X-ray fluorescence (XRF) and electron microprobe (EMP) will constrain magma chamber processes. Trace element data, obtained by inductively coupled plasma mass spectrometry (ICP-MS), will help to define the degree of mantle melting and help to characterize the chemical composition of the source. Phenocryst assemblages and compositions will be used to quantify magma evolution. Petrologic studies of the volcanic rocks will also help to constrain the conditions under which the melts formed. The composition of mafic basalts and basaltic glasses, as well as mafic melt inclusions, can be used to assess mantle temperatures at which melting took place, as well as pressures and degrees of melting. Sr, Nd, Hf and Pb (double spike) isotope ratios, determined by Thermal Ionization Mass Spectrometry (TIMS) and multi-collector ICP-MS, reflect the long-term evolution of the magma sources and thus serve as tracers to identify mantle and recycled crustal material. O-isotopes provide a powerful tool for evaluating the role of crustal material in the magma source. Morphological and volcanological studies will constrain eruption processes, eruption environment and evolution of the volcanoes.

Non-magmatic rocks and Mn-Fe oxides yielded by dredging can be transferred to co-operating specialists for further shore-based analyses.

7.1.2 Rock Sampling Report and Preliminary Results of Bathymetric Mapping

The following section gives background information and short summaries of the features sampled and/or mapped on SO255 and on the rock types obtained by dredging but also presents some preliminary interpretations of bathymetric data and rock assemblages. Distances, dimensions and heights given in this chapter are approximate and are only included to give a rough idea of dimensions of morphological features. Distances between seamounts are given between the seamount tops. All photos shown in this chapter are taken by GEOMAR. Refer to Appendix I and II for exact latitude, longitude, and depth of dredge sites and more detailed rock descriptions. Figure 3.14 shows a general overview map with all SO255 sampling sites. Figures 7.5 through 7.7 show more detailed overview maps including station numbers for the southern, central, and northern sections of the working areas at Colville- and Kermadec Ridges and Havre Trough. For overview maps of the Kermadec Fore Arc sites see chapter 7.1.2.1. All overview maps are based on "The GEBCO_2014 Grid, version 20150318". Refer to Appendix III for detailed 3D-maps of all SO255 dredge tracks, a few selected 3D maps are also shown in this chapter.

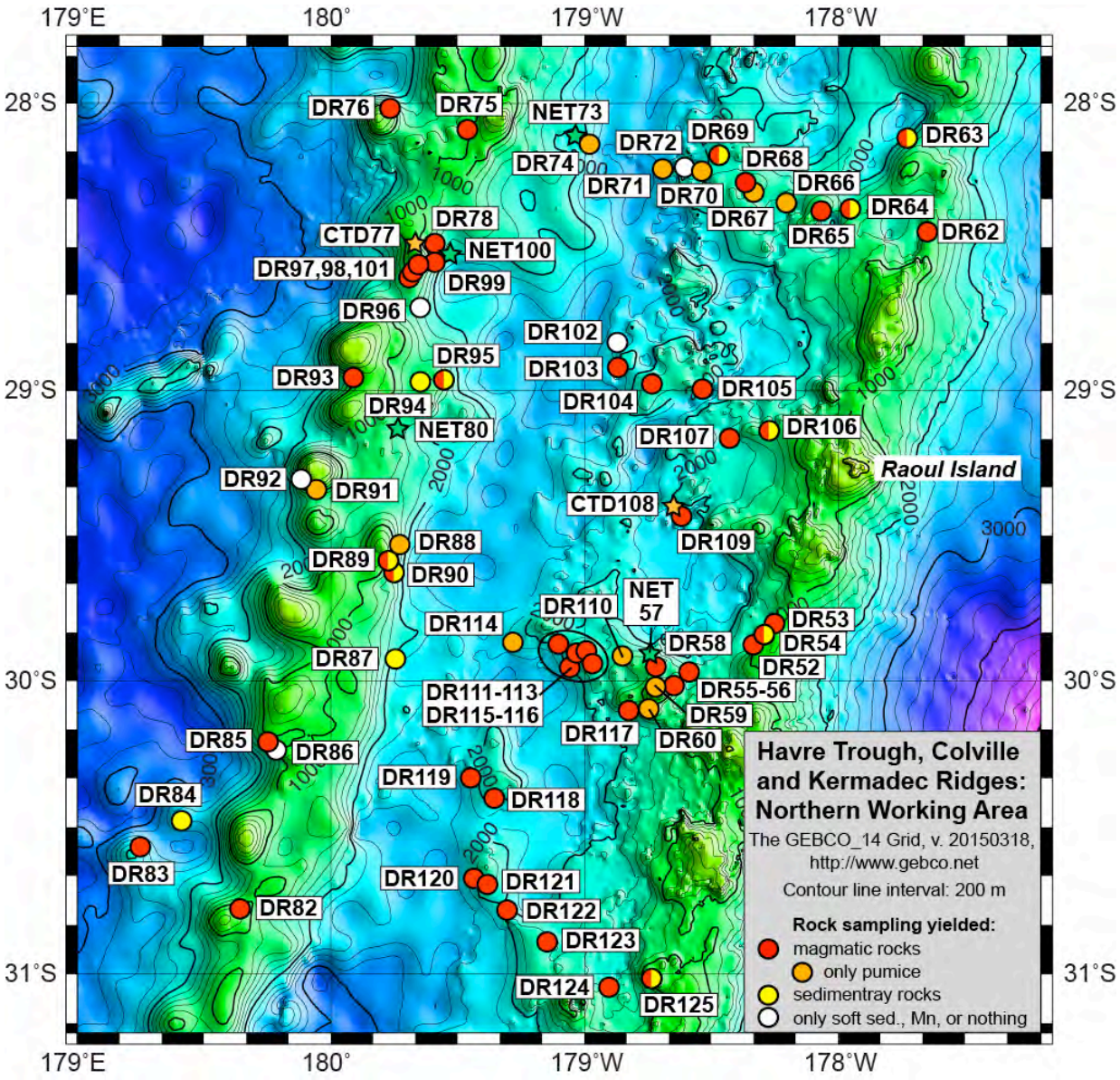

Fig. 7.5: Overview map showing the northern section of the working areas at Colville- (left) and Kermadec Ridges (right) and Havre Trough (center). Dots and stars mark SO255 sampling stations (DR - dredge, NET - plankton net, CTD - CTD rosette water sampler).

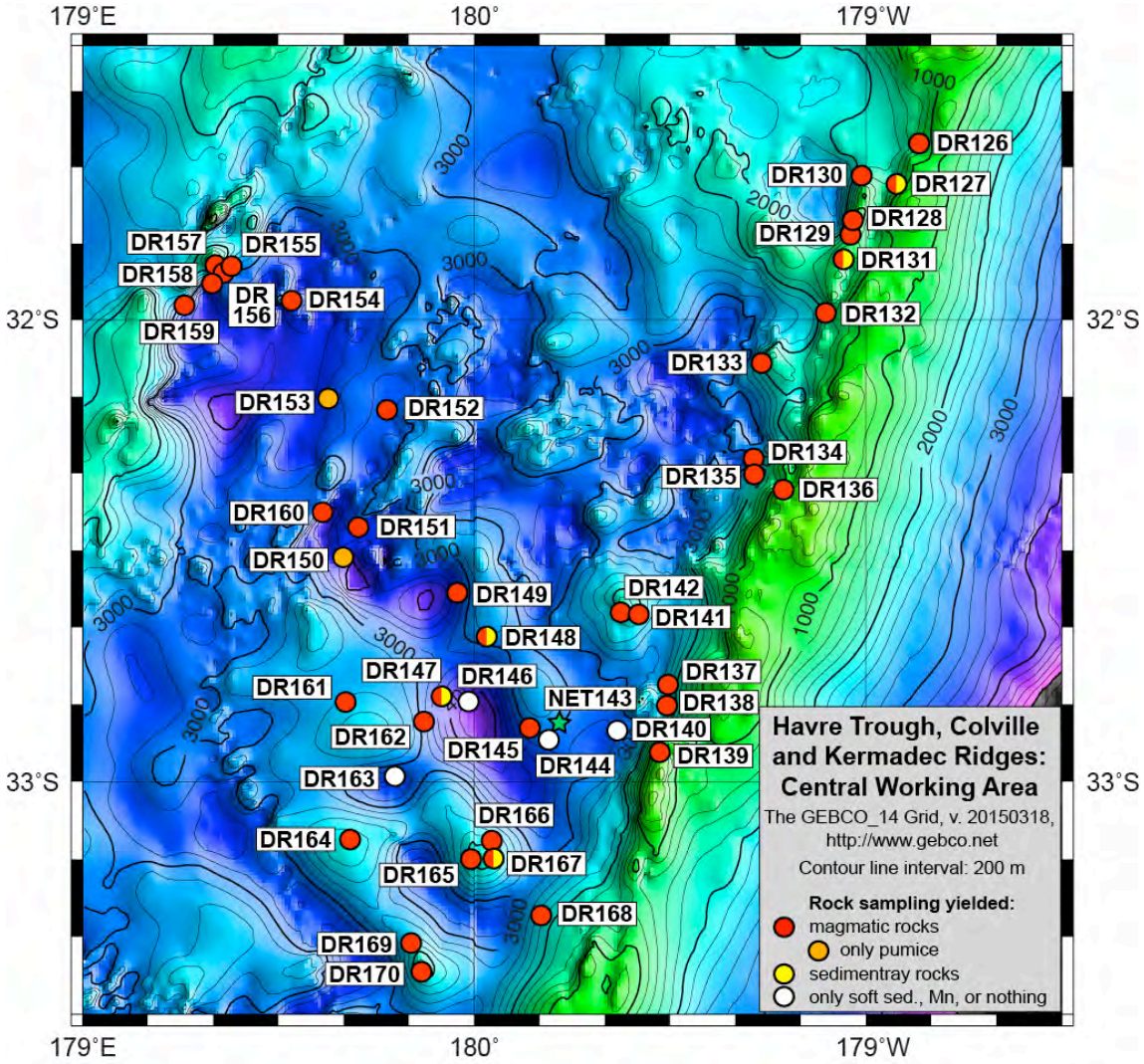

Fig. 7.6: Overview map showing the central section of the working areas at Colville- (left) and Kermadec Ridges (right) and Havre Trough (center).

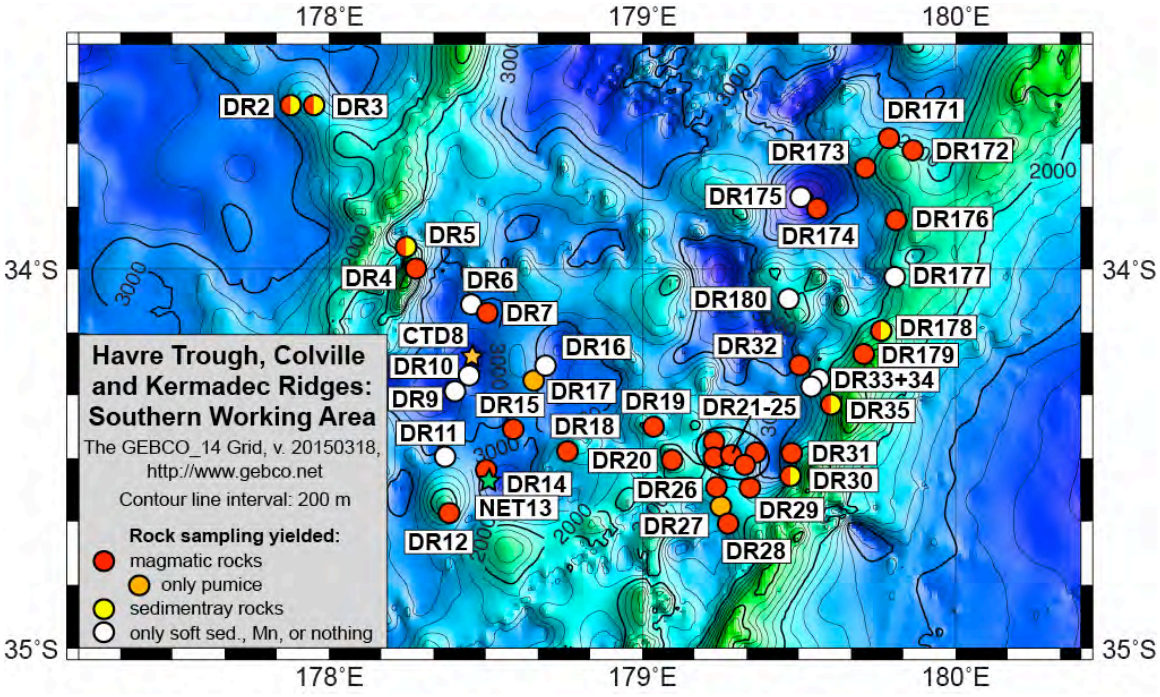

Fig. 7.7: Overview map showing the southern section of the working areas at Colville- (left) and Kermadec Ridges (right) and Havre Trough (center).

7.1.2.1 Arc Initiation and Evolution

F. Hauff, R. Werner

This chapter summarizes dredging operations to characterize the initiation and evolution of Vitiaz-Kermadec arc system. The sub-chapters categorize the sampled features by Kermadec Fore Arc, Kermadec Ridge, and Colville Ridge.

Kermadec Fore Arc (DR36 - 51)

The Kermadec Fore Arc was sampled in a single, continuous profile between stations DR36 and DR51 from 36°S to 29°S (Figs. 7.8 and 7.9). DR36 through DR38 aimed at the lowermost fore arc slope (6,800 - 7,000 m b.s.l) in the southern part of the profile and recovered exclusively semi-consolidated mudstones (Fig. 7.10). Further upslope DR39 targeted a step / scarp within the fore arc slope at ~4,400 m b.s.l and recovered polymict breccias that consist of mm-sized mafic and felsic pebbles (Fig. 7.11). DR40 and DR42 were carried out at 5,500 - 5,600 m b.s.l. along the western margin of a basin within the fore arc slope but returned empty. Further north DR43 (~5,500 - 5,000 m b.s.l) and DR44 (~8,600 - 8,200 m b.s.l.) attempted sampling the middle to lower for arc slope but returned siltstones (DR43) and semi-consolidated mudstones (DR44).

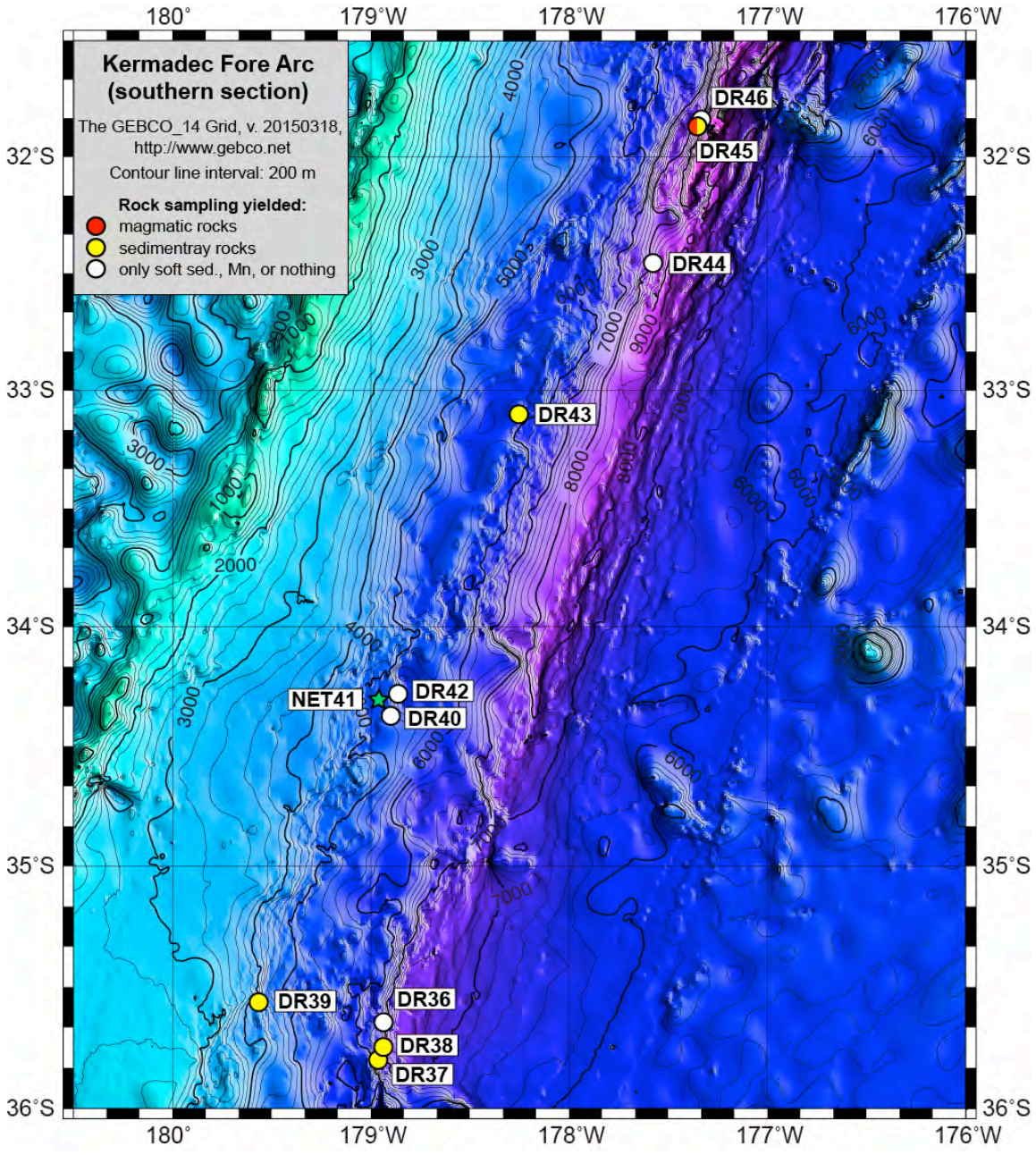

Fig. 7.8: Overview map showing the southern section of the Kermadec Fore Arc profile.

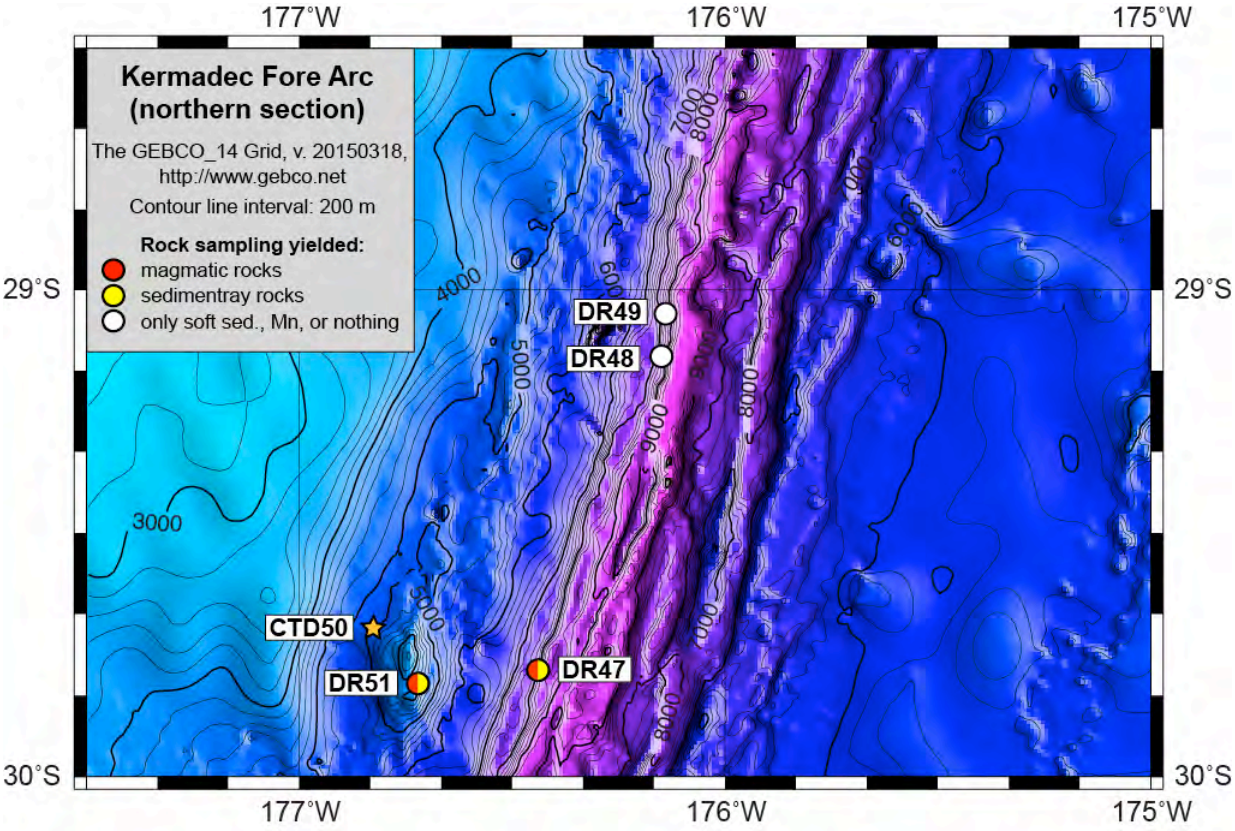

Fig. 7.9: Overview map showing the northern section of the Kermadec Fore Arc profile.

Fig. 7.10: Semi-consolidated mudstone.

Fig. 7.11: Matrix supported breccia with polymict mafic and felsic pebbles.

Finally at DR45, a single fine grained gabbro or dolerite returned from the lowermost trench wall between ~8,800 and 7,800 m b.s.l. (Figs. 7.12 and 7.13). The rock is moderately altered and consists of Plg and Pyx along with minor Amph. While Plg and Amph may provide cooling ages, possible zircons may reveal intrusion ages by U-Pb dating. Still the rock is sub-rounded to rounded which may indicate transport from further upslope. Notably volcaniclastic rocks and fine grained sandstones were also recovered along, further indicating that the gabbro / dolerite is very likely talus. Nearby DR46 returned semi-consolidated mud. Additional igneous material from the lowermost fore arc slope was recovered from DR47 (~8,100 - 7,700 m b.s.l). Here a fairly fresh and dense lava with small Fsp and Pyx phenocrysts was sampled (DR47-1, Fig.

7.14) and could be part of a dike or center of a thick lava flow. Serpentinite attached in patches on the outside indicates that this rock may be part of a melange. Age and geochemistry may help to distinguish between arc crust or accreted ocean crust. More strongly to very strongly altered Fsp-Pyx phyric volcanics were sampled from DR47-2 through -9 along with various volcaniclastics (-10 to 16) and sediments (-17 to 20). Final attempts to recover igneous material from the lower fore arc at DR48 and DR49 returned empty or with mudstones respectively. A large seamount within the fore arc slope west of DR47 marks the last dredge of the profile at DR51 (4,450 - 4,150 m b.s.l.) and returned possible igneous rocks (DR51-1 to -3) but they could also be fine grained sandstones.

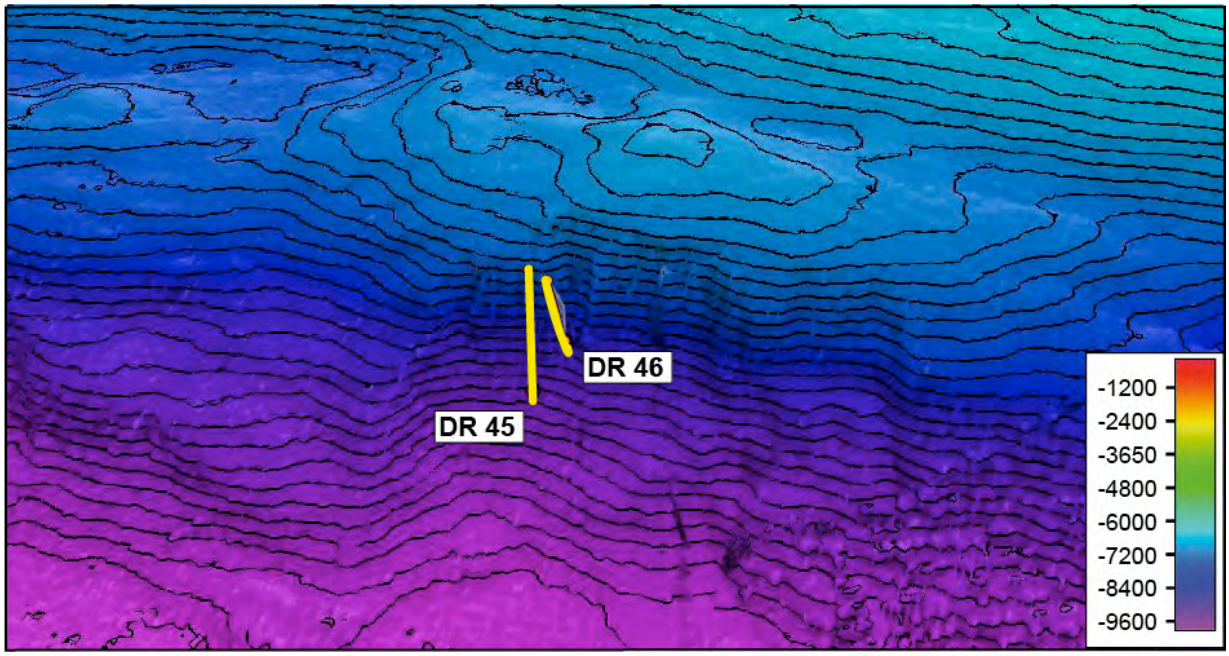

Fig. 7.12: Dredge sites DR45 and 46 at the lowermost Kermadec trench wall (view from ESE to WNW). The map is based on multi-beam data recorded on SO255 and on a comprehensive data set kindly provided by the Institute of Geological and Nuclear Sciences (GNS) (stereo exaggeration: 2x; interval of contour lines: 100 m).

Fig. 7.13: Moderately altered fine grained gabbro or dolerite.

Fig. 7.14: Fairly fresh Plg-Fsp phyric, dense lava. Note serpentinite patches attached on the outside.

In summary, sampling of the Kermadec Fore Arc in the SO255 survey area mainly returned

semi-consolidated mud and sediments from the lowermost to uppermost fore arc slope that lies immediately west of the plate boundary. The predominant occurrence of semi-consolidated mud is interpreted to be accreted sediment of the fore arc wedge while sediment from the middle slope (e.g. DR39) may well represent fore arc sediments that originate from the Kermadec / Vitiaz arc. Recovery of igneous rocks is restricted to DR45 and DR47. While a gabbro / dolerite at DR45 is likely to have undergone some transport from further upslope, serpentinite encrusted igneous rock fragments indicate possible presence of a tectonic melange but requires age and geochemical data to distinguish between arc or accreted ocean crust origin.

Kermadec Ridge (DR30 - 35, DR52 - 54, DR62, DR63, DR125 - 139 and DR177 - 179)

Genetically the Kermadec Ridge represents the eastern remnant of the split Vitiaz Arc. Complications arise from the intersection of todays volcanic front at c. 31°S with the Kermadec Ridge. South of here, the volcanic front strikes oblique but west of the Kermadec Ridge whereas north of 31°S volcanic front edifices are built on the Kermadec Ridge making a distinction between earlier Vitiaz crust and the active volcanic front by morphology difficult. Even the distinction between early arc basement and material transported from nearby arc volcanoes may not be clear. Going from south to north the Kermadec Ridge was sampled from 34°35'S to 28°10'S in five focus areas. DR30 to 35 and DR179 to DR177 are the southernmost stations (Fig. 7.7) followed by the central part from DR139 to DR125 where todays volcanic front intersects the Kermadec Ridge (Figs. 7.5 and 7.6). The northern part of the working area targeted ridges in-between large stratovolcanoes at DR52 to DR54 and DR62 and DR63, the northernmost SO255 station (Fig. 7.5).

The southern Kermadec Ridge was successfully sampled between 34°35' to 34°10'S along its west-facing flank. Igneous rocks recovered here are fairly fresh to medium altered Fsp-Pyx ±Ol phyric andesites and many of them appear suitable for age dating and geochemistry (e.g., Fig. 7.15). DR33, 34 and 177 returned empty. DR179 marks a particular successful dredge with five, petrographically different lava units, a volcaniclastic unit that amongst others bears glassy contact zones to lava (Fig. 7.16) or contains large angular lava clasts. The lava units comprise Ol-Fsp, Fsp-Pyx, and Fsp phyric varieties but also Fsp-Pyx lava or even aphyric, seemingly, more evolved lava.

Fig. 7.15: Dense, fairly fresh basaltic andesite with 25% Fsp and 10% Pyx phenocrysts.

Fig. 7.16: Glassy contact zone between reddish volcaniclastic rock and Fsp-Pyx phyric lava.

In the central portion of the Kermadec Ridge (~33° to 31°S) DR137 to DR139 and DR134 to DR136 aimed at sampling up-section profiles along the western flank. Going from base to top DR137 (~2,500 - 2,050 m b.s.l.) provided Fsp rich, altered lava fragments whereas mid-section DR138 (~1,900 - 1,500 m b.s.l.) gave various Pyx-Fsp bearing, angular lava fragments from breccias. DR139 (~1,000 - 600 m b.s.l.), the shallowest portion of the profile, returned various rounded to sub-rounded lava clasts (Fig. 7.17) from which 4-5 petrographical groups were

initially identified and range from fairly fresh to medium groundmass alteration with variable amounts of Fsp and Pyx. In addition DR139 contained abundant reef carbonate and fossils which manifest that this part of Kermadec Ridge once belonged to the photic zone and that recovered lavas are likely from younger volcanic activity of the Vitiaz Arc. The samples, however, lack clear indications of subaerial or submarine eruption environment. The second profile recovered volcaniclastics and breccias that contain fairly fresh clasts of Plg phyric lava at the base (DR134, ~2,950 - 2,750 m b.s.l.) and Ol-Pyx pillow lava with sometimes fresh glass in the middle section (DR135, ~2,300 - 2,000 m b.s.l., Fig. 7.18). The shallowest portion (DR136, ~1,200 - 1,000) provided slightly altered Plg-Pyx andesitic lava boulders without any glass.

Fig. 7.17: Slightly altered Pyx-Fsp phyric lava from near crest of Kermadec Ridge at ~600 - 1,000 m b.s.l.

Fig. 7.18: Fresh Ol-Pyx±Fsp pillow lava from ~,2300 - 1,950 m b.s.l. along western flank of Kermadec Ridge.

Stations DR132, -131, -127 and -126 aimed at sampling the western flank of the Kermadec Ridge at variable depths (~800 - 2,000 m b.s.l., Fig. 19). They are located along steps / scarps that run ± parallel to the overall strike of Kermadec Ridge and are likely related to splitting of the Vitiaz Arc and extension of the Havre Trough.

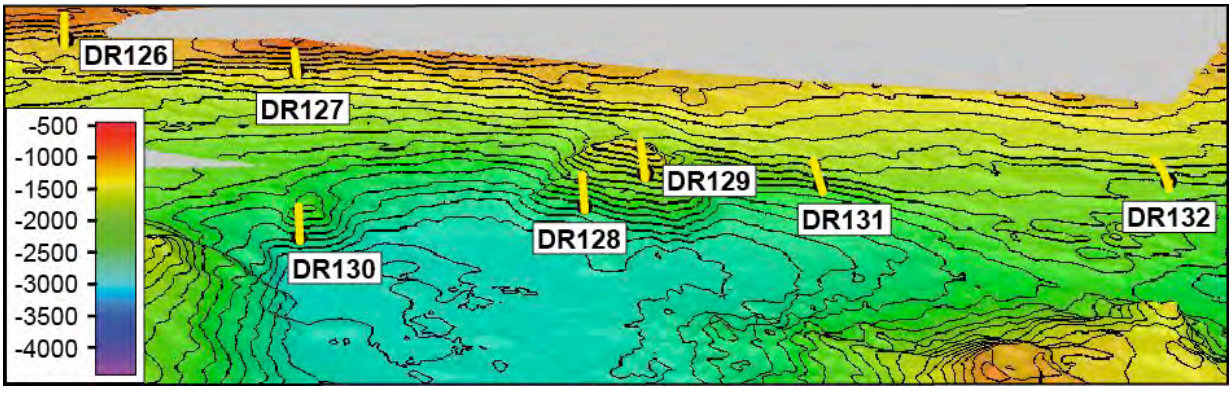

Fig. 7.19: Dredge tracks at the central part of the Kermadec Ridge sampling its western flank as well as volcanic edifices on the ridge (view from WNW to ESE). Stereo exaggeration, contours, and data sources as in figure 7.12.

Going from south to north, DR132 provided relatively fresh Fsp phyric lava with minor Pyx and occasional Ol. Some fragments contained fresh glass and testify a submarine origin. DR131 recovered fresh to slightly altered Fsp-Ol-Pyx phyric lava fragments but without any fresh glass. Volcaniclastic rocks dominate in DR127 but some contain cm-sized volcanic pebbles that may be useful for geochemistry and geochronology. DR126 is characterized by

aphyric to near aphyric lava that in places has developed columnar cooling structures. The matrix in most samples of this dredge is altered to yellowish brown but overall appear suitable for geochemistry, whereas Fsp occurs only in the few percent range making dating difficult. A large, partially tectonized volcanic edifice is located at 31°48' on the western flank of the Kermadec Ridge and has been sampled at DR128 and DR129 (Fig. 7.19). As this structure clearly sits on the western flank of Kermadec Ridge and is cut by NNE-SSW trending faults, it must have formed after or during splitting of the Vitiaz Arc and has been even affected by faulting after its emplacement. Nearby DR130 is a small cone along the western margin of a deep basin that is located in-between volcanic front edifices slightly west of Kermadec Ridge. Therefore DR128 through DR130 are likely not to represent old Vitiaz Arc basement but rather be genetically linked to arc rifting. DR128 recovered only a few Ol-Pyx phyric rocks with very minor Fsp but overall very fresh appearance. Ol and Pyx are fairly large (0.5 -1 cm) and the rocks resemble ankaramites somewhat similar to those of DR28. A full dredge with very fresh mafic rocks was obtained at DR129 and basically confirmed the occurrence of abundant ankaramitic rocks at this tectonized Kermadec Ridge seamount (Fig. 7.20). DR129 samples range from ultraphyric Cr-diopside – Ol bearing lava to less phyric varieties with subordinate Fsp. Less phyric to aphyric lava also occurs as well as Ol rich samples. In some samples Ol is unevenly distributed indicating incomplete mixing of lava / melt batches. Notably, only one sample (DR129-10) contained fresh glass that will permit direct determination of the primary melt composition of the erupted lava. Overall these rocks appear to have undergone rather complex melt evolution and magma reservoir processes. The small seamount (DR130) at the margin of the basin (Fig. 7.19) gave slightly altered Plg phyric pillow lava with minor partially altered Ol but fresh glassy margins.

Fig. 7.20: Fresh ankaramitic lava from tectonized seamount on the western flank of Kermadec Ridge.

Fig. 7.21: Fresh Plg phyric lava from the northern part of Kermadec Ridge.

DR125 is located right at the intersection of the Kermadec Ridge with the volcanic front. Since the site is located right within a fault that cuts through the entire SW-facing flank of the edifice it was hoped to recover rocks from the underlying Kermadec Ridge basement but the recovered rocks may as well belong to younger volcanic front volcanism. Sampling reveals fresh lava fragments embedded in a carbonated matrix and distinguishes a less Pyx/Fsp phyric andesite group from a highly phyric Pyx/Fsp andesite group. In the northern portion of the Kermadec Ridge, DR52 through DR54 sampled the west-facing slope of a ridge north of Macauley Island. All dredges recovered variable volcaniclastic rocks and only DR54 rocks contained larger lava clasts in breccias that may be suitable for chemistry and dating. The two northernmost dredge hauls at the Kermadec Ridge recovered fresh to slightly altered, glass bearing, highly Plg phyric lava along with less phyric and aphyric varieties at DR62 (Fig. 7.21). Highly altered lava with variable amounts of Plg and Pyx phenocrysts were obtained at DR63.

Colville Ridge (DR2 - 5, DR75, 76, 78, DR82 -101 and DR155 -159)

The Colville Ridge is the remnant of the Vitiaz Arc that rifted from the Kermadec Ridge during the opening of the Havre Trough. SO255 sampling and mapping focused on the less surveyed area between 31°S and 28°S but also included stations in previously mapped areas at 31°55'S and 33°30'S to 34°S (Figs. 7.5 - 7.7). SO255 stations at Colville Ridge are summarized in the following in a profile going from south to north. The two southernmost stations DR4 and 5 were carried at a large ridge east of Colville Ridge that presumably rifted away (Fig. 7.22). DR4 recovered a full dredge from the midsection (~1,800 - 1,300 m b.s.l.) of the eastern flank that included up to 1 m sized angular blocks of andesite, breccias and plutonic rocks. Many showed evidence of hydrothermal overprint and mineralization (Fig. 7.23). A total of 42 samples were taken to cover the full variation. The dredge appears to have collected a lava / subvolcanic sequence that is partially mineralized. DR5, carried out at the base of the northwestern flank (~2,300 - 1,900 m b.s.l.) of the ridge, delivered medium to strongly altered andesites with variable amounts of Fsp and less volumes of mafic minerals. DR2 and 3 at 33°32'S are located west of the Colville Ridge along a NW-SE striking ridge that is connected with the Colville Ridge. Basic idea is to explore if this volcanism is a young feature related to recent back-arc volcanism or a manifestation of earlier volcanism behind the Vitaz Arc. Both dredges recovered limited volumes of volcaniclastic material that contained small fragments of altered lava (Fig. 7.24).

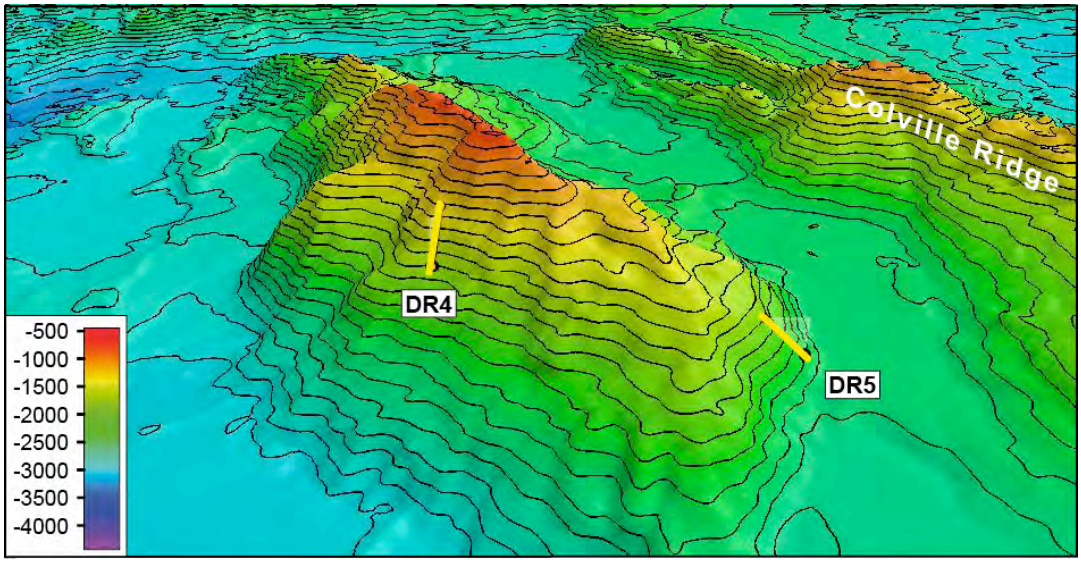

Fig. 7.22: Dredge tracks DR4 and 5 at a rifted (?) ridge east of Colville Ridge (view from NE to SW). Stereo exaggeration, contours, and data sources as in figure 7.12.

Fig. 7.23: Hydrothermally overprinted mirco-grabbro / dolerite from a rifted (?) ridge east of Colville Ridge.

Fig. 7.24: Volcaniclastic rock with strongly altered sub-rounded volcanic fragments from a NW-SE striking ridge northwest of Colville Ridge.

In the central Colville area (ca. 31°55'S) covered by SO255 sampling concentrated on a steep west-facing cliff that elevates ca. 2 km (Fig. 7.25). DR155 through DR157 aimed at sampling a profile from lower mid section to near the crest of Colville Ridge. All recovered rocks are greenish colored and range from fine grained tuff (?) / lava (?) (DR155) to volcaniclastics with cm-sized lava fragments (DR156) and breccias (DR158). The green color of these rocks indicates possible location at deeper crustal levels (greenshist facies?) prior to uplift during rifting (Fig. 7.26). The depositional environment may be the Vitiaz back arc, which in this case may not be necessarily connected to volcanism. Still, Plg-Pyx phyric andesites were recovered from the very base of the scarp at DR158 (Fig. 7.27) and DR159.

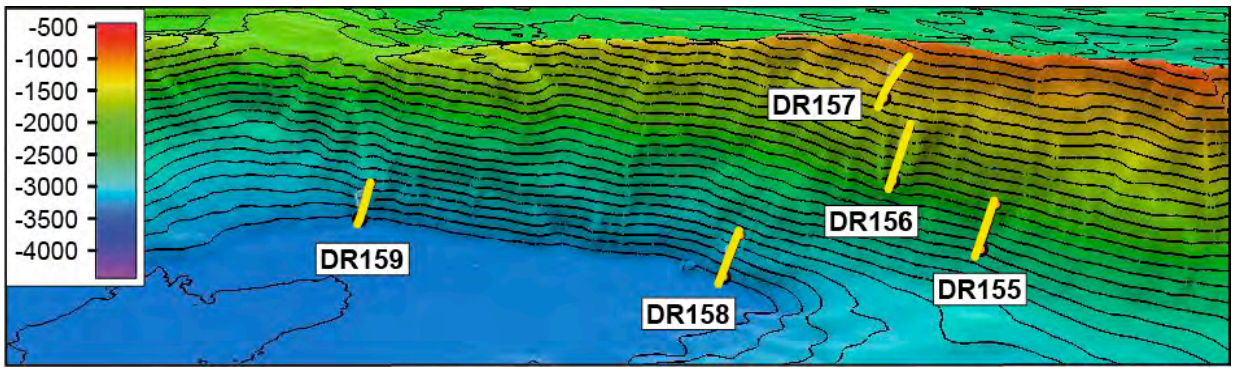

Fig. 7.25: Dredge tracks DR155 - 159 at a steep, west-facing cliff at the Colville Ridge (view from SE to NW). Stereo exaggeration, contours, and data sources as in figure 7.12.

Fig. 7.26: Greenshist facies metamorphosed tuff or very fine grained aphyric lava from near base of a east-facing cliff of Colville Ridge.

Fig. 7.27: Slightly altered Plg ±Pyx phyric andesite from the very base of Colville Ridge.

In the northern part of the Colville Ridge working area DR82 through DR84 aimed at circular shaped seamounts on the Colville Ridge (DR82) and west of it (DR83 and 84). While the seamount sampled by DR82 (~820 - 600 m b.s.l.) appears to be a guyot, the peaks of DR83 and 84 are conical and located in deeper water (~1,500 m b.s.l.). DR82 delivered strongly altered sediments and volcaniclastics along with biogenic components. DR83 gave sediment with heavily altered volcanic components and DR84 Mn-encrusted sediment. DR85 along the western margin of Colville Ridge is the only dredge that delivered significant volcanic material from the ridge between 31° to 30°S. These include moderately altered highly Plg phyric andesite with some Pyx along with more altered and less Plg-Pyx phyric material. DR86 at the same structure further up section returned empty. The east-facing flank of Colville Ridge between 30°S to 29°S was sampled at DR87 to DR90. Return of volcanic material was limited to a fresh andesite along with abundant, altered volcanic clasts at DR89 and volcanic

components in sediments at DR90. Faulting at the eastern Colville Ridge in this area either appears not to have penetrated into deeper levels of the Vitiaz Arc crust.

A large guyot west of Colville Ridge was aimed at DR91 and DR92 but the dredges returned only younger pumice (DR91) or glassy sponges at DR92. Altered dacitic lava with Fsp and Amph were obtained from the western flank of Colville Ridge at DR93 (Fig. 7.28) whereas of DR94 through DR96 along the eastern flank only DR95 recovered volcaniclastic rocks that contain abundant volcanic clasts which may be useful for geochemistry and dating. At ~28°35'S, a split part of the Colville Ridge was extensively sampled (Figs. 7.29 and 7.30) since faulting, especially along the east-facing flank of the western ridge (DR97 - 101) appeared young and intense. Indeed a fairly large number of volcanic material was recovered but all of them appeared to have undergone short distance transport processes as they occurred in breccias or as cobbles or conglomerates. Although many lava clasts in the breccias are heavily altered Plg-Pyx phyric andesites many of them possess less altered to fresh cores (DR97).

Fig. 7.28: Altered dacitic lava with 20% Plg and 10% Amph / Pyx from the western flank of Colville Ridge.

Fig. 7.29: Moderately altered highly Fsp phyric with ±Pyx recovered as large rounded clast from a conglomerate.

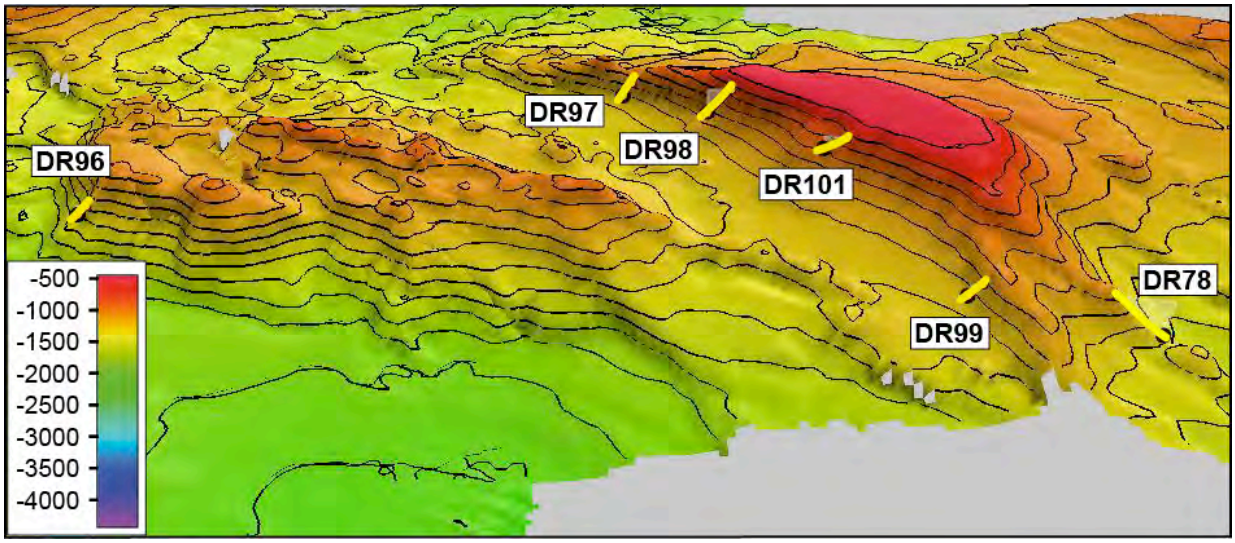

Fig. 7.30: Dredge tracks at a fault scarp at the Colville Ridge (view from E to W). Stereo exaggeration, contours, and data sources as in figure 7.12.

Some of the cobbles (DR98) and conglomerates (DR101, Fig. 7.29) are relatively fresh porphyric lavas with abundant Fsp and minor Pyx. Volcaniclastics obtained at DR99 contain cm-sized volcanic clasts that appear suitable for geochemistry. DR78 carried out along the

northern flank of the western ridge provided heavily altered igneous clasts from a breccia block. The two northernmost stations DR75 and DR76 delivered highly oxidized volcaniclastics (DR75) and relatively fresh lava ranging from highly Fsp to Ol-Pyx-Fsp phyric along with more altered Pyx-Fsp lava (DR76).

7.1.2.2 Arc Splitting and Recent Volcanism

Havre Trough

The Havre Trough represents the back-arc basin of todays Kermadec Arc. It opened c. 5 Ma ago in a zipper-like fashion from north to south when the Vitiaz Arc split. Overall this led to V-shaped alignment of the Kermadec and Colville Ridges. The northern part of the Havre Trough in the SO255 working area (ca. 28°S to 31°S) is characterized by a ca. 2,500 m b.s.l. deep, relatively flat, sediment covered basin from immediately east of the Colville Ridge to the geographic center. East of here till the volcanic front, the morphology is characterized by ridges and cones. South of 31°S the Havre Trough significantly deepens to c. 3,000 - 4,000 m b.s.l. with irregular shaped basins that are separated by ridges / cones and occupy the entire width of the Havre Trough. Due to the apparent opening of the Havre Trough from north to south, the northern part is presumably in a more advanced stage of extension while the southern part is in an earlier stage of rifting in which tectonics and volcanism dominate over sedimentation. SO255 sampling strategy aimed at running E-W-profiles across the Havre Trough and resulted in spacing six profiles between 34°40'S to 28°10'S. In addition deep basins (~3,800 m.b.s.l) southwest of Ngatoroirangi Volcano at 33°50'S and 180° / 32°50'S have been targeted. Going from south to north the profiles and the deep basins are summarized in the following.

Profile 1 (DR6 - 20)

This is the southernmost profile that runs roughly NW-SE from 34°05'S across the Havre Trough and terminates at 34°30'S near the Kibblewhite volcanic complex of the volcanic front (Fig. 7.31).

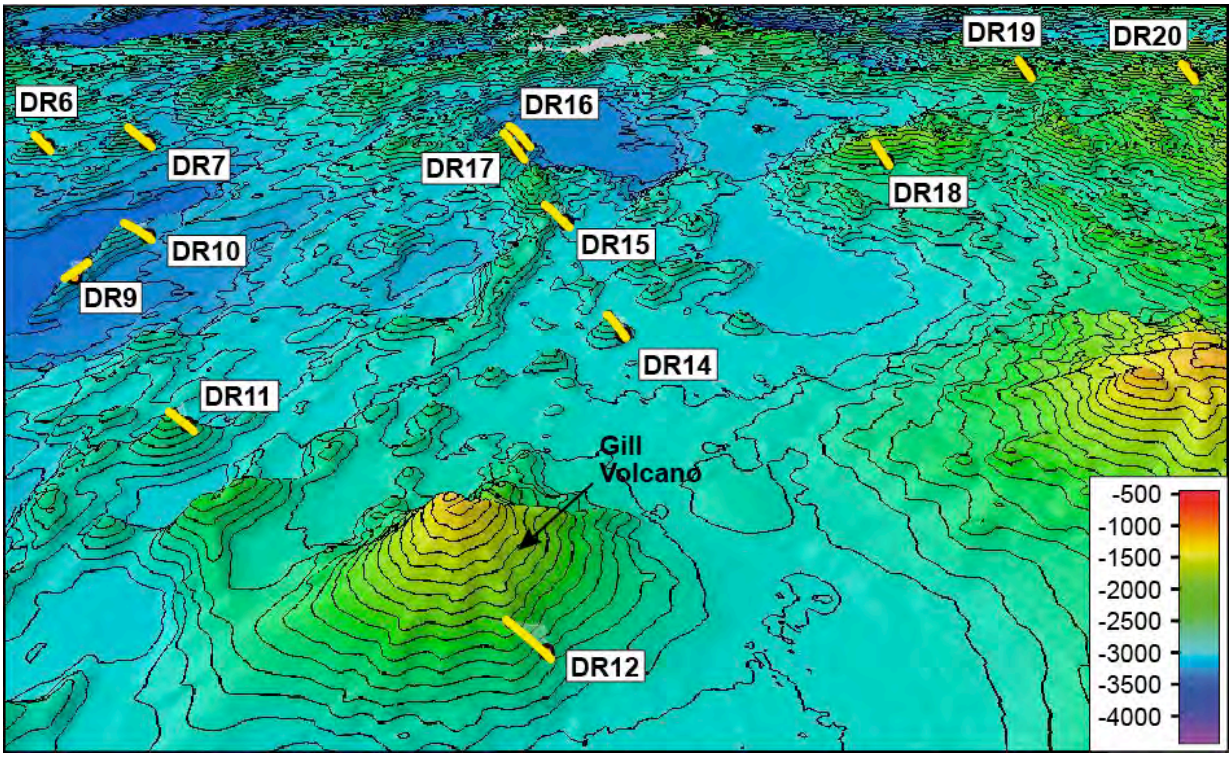

Fig. 7.31: Dredge tracks DR6 - 20 along profile 1 across the Havre Trough at c. 34°05´- 34°30´S (view from SW to NE). Stereo exaggeration, contours, and data sources as in figure 7.12.

One target were ridges to test if these represent newly formed Havre Trough or remnant blocks of Vitiaz Arc crust. Out of four attempts (DR9, 10, 15, 16, and 14), only DR15 (~3,000 - 1,500 m b.s.l.) returned a single large bock of pillow breccia embedded in a hyaloclastite

matrix that contains abundant fresh glass shards (Fig. 7.32). The pillow fragments are slightly altered Ol-Pyx phyric to near aphyric lava. Cones and seamounts were dredged at DR6, 7, 11, 14, 18, 19 and 20. The largest structure was Gill Volcano at DR12 (Fig. 7.31). Successful dredges at DR7 (~3,000 - 2,600 m b.s.l.) returned fresh Ol-phyric lava with fresh glass while Mn-encrusted, slightly altered Ol-Pyx lava was obtained at DR14 (~2,800 - 2,400 m b.s.l.), and Pyx phyric lava with fresh glassy margins beneath several mm Mn-crust at DR18 (~2,900 - 2,500 m b.s.l.). DR19 (~2,000 - 1,650 m b.s.l.) returned slightly altered Plg phyric lava with minor amounts of Ol but fresh glass in samples -1 through -3. Again slightly altered Pyx phyric lava with subordinate occurrences of Ol and Plg in some samples were recovered at DR20 (~1,900 - 1,600 m b.s.l., Fig. 7.33) at the southeastern end of the profile. DR12 (~2,500 - 2,100 m b.s.l.) along the southeastern flank of Gill Volcano returned fresh Ol-basalt with possible occurrences of Fsp (sample -3) and Pyx (samples -5 and -8). Significant amounts of pumice that presumably originates from volcanic front edifices were obtained at DR6 (~2,900 - 2,450 m b.s.l.), DR15, and DR17 (~2,900 - 2,500 m b.s.l.).

Fig. 7.32: Ol-Pyx phyric pillow breccia in yellowish hyaloclastite containing fresh glass shards.

Fig. 7.33: Slightly altered Pyx phyric lava with minor fresh Ol from the southeastern end of profile 1.

Deep basin southwest of Ngatoroirangi Volcano (DR174 and DR175)

This basin at ~179°32'E / 33°50'S lies 3,800 m b.s.l and marks one of the deepest areas in the southern Havre Trough. DR174 (~3,600 - 3,300 m b.s.l.) sampled the northwest dipping slope of a ridge extending into this basin and recovered two very small pieces of Ol phyric lava with chilled margins. DR175 (~3,800 - 3,750 m b.s.l.) carried at the basin floor across a mound like structure returned empty.

Profile 2 (DR140, DR144-154, DR160-164 and DR168)

This SE-NW striking profile runs broadly from ~32°55' at the Kermadec Ridge to 31°57' at the Colville Ridge. DR140, 144, 146 and 163 at the southeastern termination were empty and DR150 in the center and DR153 at the northwestern end returned only volcanic front derived pumice. NE-SW striking ridges were aimed at DR140, 144, 145, 148, 149, 150, 151, 160 and 161 (Fig. 7.34). From these DR145 (~2,900 - 2,400 m b.s.l.) provided only a single rock of slightly altered, near aphyric Plg-Pyx lava. Again only few rocks of fresh glassy pillow lava with Fsp phenocrysts and minor Ol and Pyx were obtained at DR148 (~3,100 - 2,800 m b.s.l.). At DR149 (~3,600 - 3,250 m b.s.l.), two pieces of fresh Pyx-Plg lava with fresh glass underneath 1 mm Mn-crust were sampled. A larger variety of lavas has been obtained at DR151 (~3,500 - 2,550 m b.s.l.) that includes Ol basalt (Fig. 7.35), Pyx and Fsp phyric lavas as well as aphyric varieties. Pyx-Ol phyric sheet flow lava without glass returned from DR160 (~3,450 - 3,050 m b.s.l.) while a NE-SW elongated seamount / ridge structure at DR161 (~2,600 - 2,150 m b.s.l.) gave aphyric lava with some pieces having glassy margins. Cones and smaller seamounts were targeted at DR152, 153, 153, 163, 164 and 168. An oval shaped NE-SW striking seamount at DR152 (~3,100 - 2,600 m b.s.l.) returned a single, small piece of fresh Ol-Pyx-Fsp phyric lava. From a similar structure at DR154 (~2,700 - 2,400 m b.s.l.) two pieces of

medium altered lava but with fresh Ol were sampled.

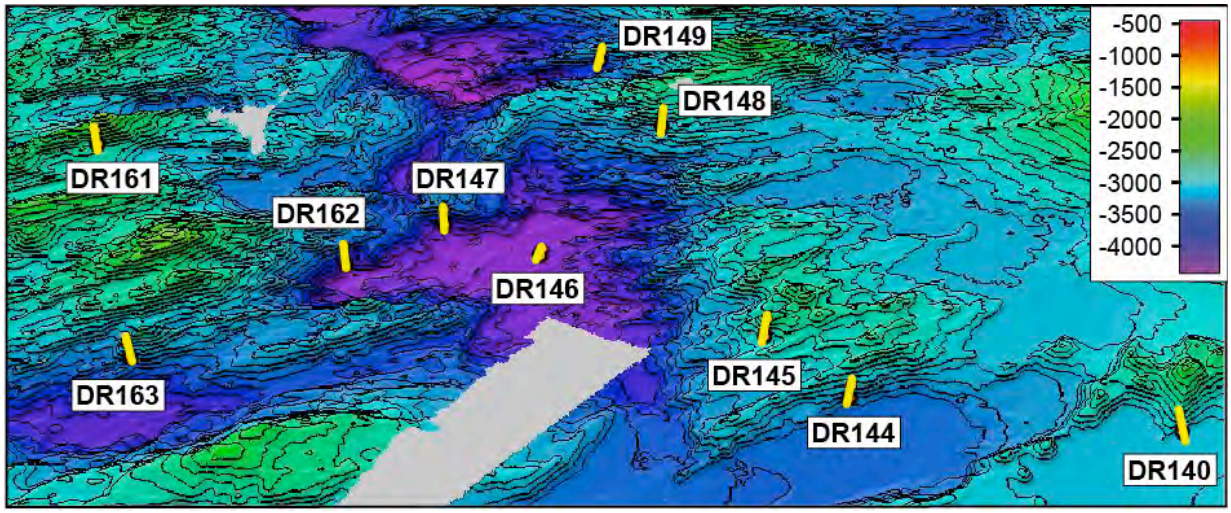

Fig. 7.34: Dredge tracks at ridges and a deep basin along profile 2 across the Havre Trough (view from SSE to NNW). Stereo exaggeration, contours, and data sources as in figure 7.12.

The last two, truly circular cones are located a bit southwest of profile 2. DR164 (~1,900 - 1,550 m b.s.l.) located east of Kuiwai Volcano gave a full, homogeneous dredge of fresh Fsp-Pyx-Ol lava with abundant fresh glass rims. DR168 at a cone located southeast of Kuiwai Volcano at the base of Kermadec Ridge returned a small piece of strongly altered, slightly Ol-Pyx phyric lava that is covered by 1 - 2 cm thick Mn-crust. The overall relation to Havre Trough, Volcanic Front, and Kermadec Ridge is unclear and geochemistry and dating will prove difficult for this sample.

Fig. 7.35: Ol-phyric pillow lava with glassy rim from a NW-SE striking ridge .

Fig. 7.36: Fine grained plutonic rock from the northwestern margin of a deep basin.

Another attempt to sample a pillow (?) mound at the base of a deep basin was carried out at DR146 (~4,100 - 4,000 m b.s.l.) but returned empty. The northwestern margin of this basin was, however, successfully sampled at DR147 (~3,900 - 3,600 m b.s.l.) and DR162 (~4,000 - 3,450 m b.s.l.) (Fig. 7.34) and may reveal older crust of the Havre Trough. At DR147 the dredge is composed of mostly basalts, one plutonic rock and some sediments that include breccias with plutonics. The basalts are mostly fairly fresh, slightly Ol phyric lavas that sometimes also contain Pyx and very rarely Fsp. Sample DR147-4 is a fine grained

holocrystaline rock that is either a micro-gabbro or diabase (Fig. 7.36). At DR161 four principle lava facies have been identified: 1) fresh Ol-Pyx phyric with and without glass, 2) aphyric to slightly Ol-Pyx phyric with and without glass; 3) a highly Ol microphenocrystic (<1 mm) group and 4) a more altered vesicle filled Ol basalt.

Profile 3 (DR118 - 123)

This profile is located near the boundary of the deep southern Havre Trough to the northern, shallower part of the trough. The profile strikes from northwest of Havre Volcano at 30°53' to 30°20' where the ridge / cone morphology terminates and the deep, flat, sedimented part of the Havre Trough begins. Overall six successful stations were carried out and none (except DR119) contained pumice despite the nearby 2012 eruption of Havre Volcano. Going from northwest to southeast the northwesternmost site at DR119 (~2,150 - 1,800 m b.s.l.) was carried along the southeastern flank of a NE-SW striking cone / ridge structure and is composed of near aphyric fresh lava with minor Ol and Pyx. DR118 (~1,700 - 1,400 m b.s.l.) sampled the southeastern flank of a large plateau like structure and delivered fresh Ol phyric pillow lava with fresh glass. Fresh Ol-Pyx phyric pillow lava with glass was obtained at DR120 (~2,100 - 1,800 m b.s.l., Fig. 7.37) along a NW-SE striking ridge. A large conical shaped seamount at DR121 (~1,750 - 1,350 m b.s.l.) provided a few Ol-Pyx phyric lava fragments without glass. Another NE-SW striking ridge at DR122 (~2,000 - 1,800 m b.s.l.) sampled fresh Ol phyric pillow lava with glass. DR123 (~2,000 - 1,800 m b.s.l.) was the final station of profile 3 and delivered fresh Ol-Pyx ± Fsp pillow lava with fresh glass (Fig. 7.38) from the southeastern flank of a small cone immediately northwest of Havre Volcano.

Fig. 7.37: Ol-Cpx phyric pillow lava with glassy rim from a NW-SE striking ridge.

Fig. 7.38: Pyx-Ol ± Fsp basalt from cone northwest of Havre Volcano .

Profile 4 (DR110 - 117)

This short profile is essentially a northwestern extension of the SE-NW striking bathymetric high that houses the Giggenbach Volcanic Field of the volcanic front. The western- and easternmost sites of the profile at DR114 cone (~2,400 - 2,100 m b.s.l.) and DR110 ridge (~1,800 - 1,500 m b.s.l.) returned only pumice. A small, circular cone at DR113 (~1,550 - 1,250 m b.s.l., Fig. 7.39) provided several large pillow fragments of fresh Plg phyric lava with very minor Ol and fresh glass (Fig. 7.40). A single large pumice was also recovered that presumably originates from the 2012 eruption of Havre Volcano. The center of the profile is occupied by a large, newly discovered caldera forming edifice (Fig. 7.39). The inner caldera walls were sampled at DR111 (~1,450 - 1,200 m b.s.l.) with slightly altered Plg phyric dacite with minor Pyx and at DR112 (~1,550 - 1,250 m b.s.l.). Here lots of Plg phyric, glassy lava was obtained (Fig. 7.41) and subdivided into five lithological units based on freshness, degree of vesicle filling / lining, encrustation and Plag-phenocryst abundance. The outer caldera flanks were targeted at DR115 (~1,550 - 1,250 m b.s.l.) along mid-slope while DR116 (~1,500 - 1,100 m b.s.l.) aimed at a satellite cone at the eastern caldera rim. DR115 delivered felsic glassy, pillow-like rock fragments that resemble obsidian and are probably of rhyolitic composition containing small amounts of Fsp (Fig. 7.42). Pumice also occurred in DR115. Fresh Fsp-Pyx phyric pillow basalt (Fig. 7.43) was obtained from the satellite cone at DR116.

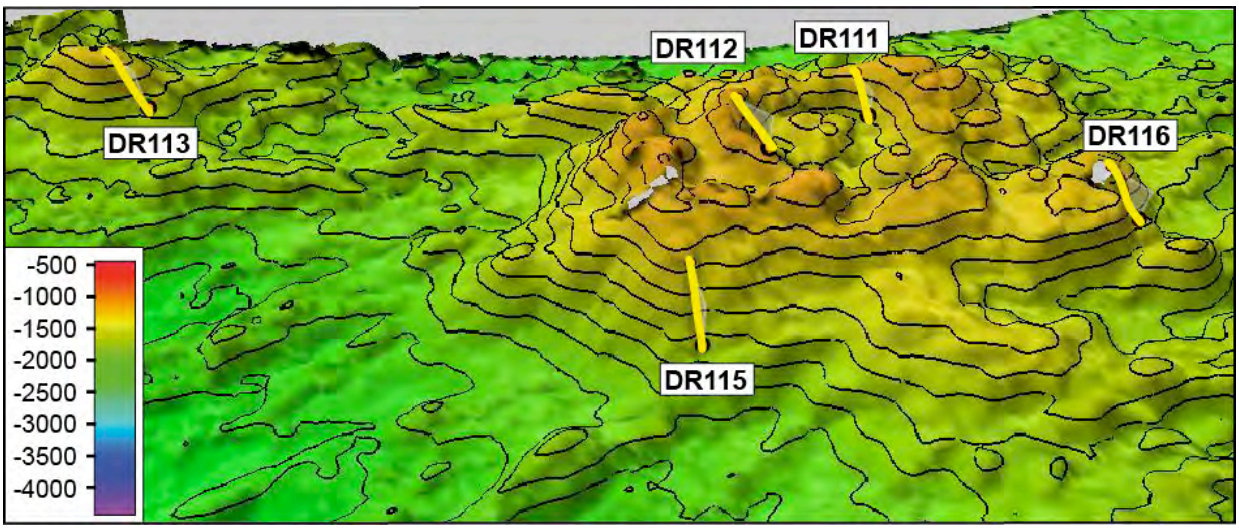

Fig. 7.39: Dredge tracks DR111, 112, 115, and 116 at a newly discovered caldera volcano in the center of the Havre Trough and DR133 at a nearby volcanic cone (view from SSE to NNW). Stereo exaggeration, contours, and data sources as in figure 7.12.

Fig. 7.40: Fresh Fsp ± Ol phyric pillow lava from small cone northwest a newly discovered caldera edifice in the center of the Havre Trough.

Fig. 7.41: Highly Fsp phyric dacitic-andesitic lava from inner caldera wall of the caldera volcano.

Fig. 7.42: Glassy, obsidian like, slightly Fsp phyric lava fragments from outer caldera wall.

Fig. 7.43: Fsp+Pyx phyric lava from satellite cone at eastern margin of caldera.

Profile 5 (DR102 - 109)

Another short SE-NW profile extends half way into the Havre Trough from Raoul Island. DR102 (~2,400 - 2,100 m b.s.l.), a NE-SE striking ridge at the northwestern end of the profile, where the ridge / cone morphology of the eastern Havre Trough ends and the deep flat western half of basin begins, returned only pumice that was not sampled into the GEOMAR repository. Nearby DR103 (~2,400 - 2,100 m b.s.l.) recoverd a large block of fresh Ol phyric pillow basalt with glassy margins (Fig. 7.44) together with smaller pillow fragments from a ridge. DR104 was made at a cone (~1,600 - 1,200 m b.s.l.) and mainly sampled fresh, glassy pillow lava that contains variable proportions of Plg-Pyx-Ol phenocrysts along with a single piece of near aphyric Plg-Pyx lava. DR105 (~2,200 - 1,900 m b.s.l.) returned fresh Pyx phyric pillow lava with 1 mm thick Mn-crust from a NE-SW-striking fault scarp. The southwestern end of a NE-SW striking ridge at DR107 (~1,800 - 1,500 m b.s.l.) consists of fairly fresh, more evolved andesitic to dacitic lava that contains minor amounts of Fsp and minute Pyx or Amph (Fig. 7.45). DR106 (~1,150 - 850 m b.s.l.) at a small circular cone WNW of Raoul Island returned fresh to slightly altered Plg-Pyx phyric lava throughout that lacks fresh glassy margins (Fig. 7.46). Southwest from here half way to profile 4, dredge haul DR109 (~2,300 - 1,850 m b.s.l.) delivered a near full dredge of slightly Ol-phyric, glassy lava (Fig. 7.47) from another NE-SW striking ridge.

Fig. 7.44: Fresh Ol basalt with thick glassy margin from NW-SE ridge at NW end of profile 5.

Fig. 7.45: Fresh, more evolved andesitic-dacitic lava with minor Fsp and few Pyx/Amph? phenocrysts.

Fig. 7.46: Fresh Plg+Pyx phyric lava from small cone northwest of Raoul Island.

Fig. 7.47: Slightly Ol phyric pillow lava with glassy margin from a NE-SW striking ridge.

Profile 6 (DR64 - 72 and 74)

This profile strikes SSE-WNW and is the northernmost across Havre Trough. Sampling focused on a fault scarp and several small cones, ridges, and elongated seamounts (Fig. 7.48). Only four out of ten dredges delivered *in situ* magmatic rocks (DR64, 65, 68, and 69) while pumice was exclusively recovered from DR66, 67, 70 and 74. DR72 returned empty. Going from east to west DR64 (~1,900 - 1,650 m b.s.l.) obtained a 1/3 full bag of heterogeneous lava fragments from a fault scarp. They range from variably phyric Fsp-Pyx (-1 to -7, Fig. 7.49), Ol phyric (-8, -10) to aphyric (-9) varieties and all lava is relatively fresh. DR65 (~1,200 - 900 m b.s.l.), located at an enlongated ridge / seamount structure, returned abundant, fairly aphyric ±Pyx, ±Fsp lava fragments including pillows with fresh glass (Fig. 7.50). Further west DR68 (~1,500 - 1,150 m b.s.l.) delivered fresh Ol-Pyx phyric pillow lava with glassy margins from a NE-SW striking ridge. A mixed dredge of pumice, sediment and a few rocks of relatively fresh, near aphyric pillow basalt with glassy margins and minor Ol-Fsp phenocrysts returned from DR69 (~1,850 - 1,400 m b.s.l.), a east-west elongated ridge.

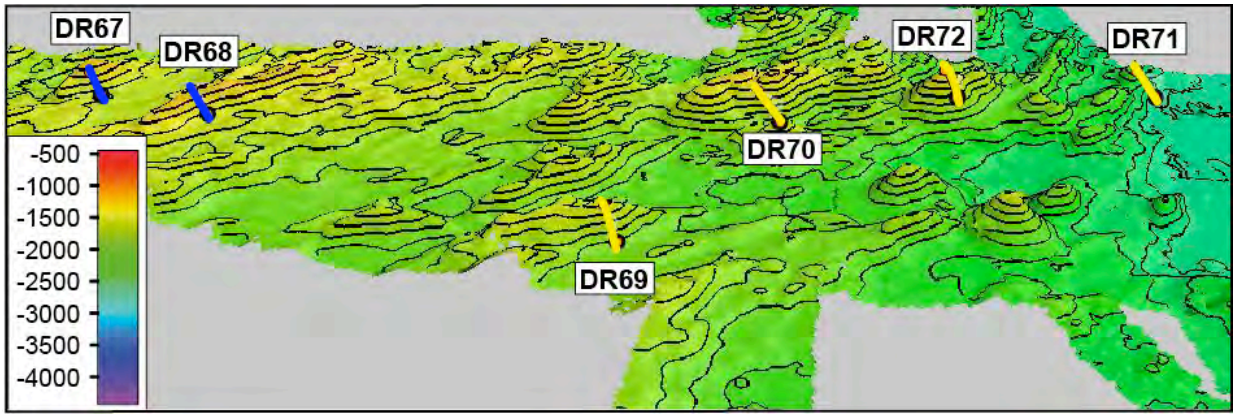

Fig. 7.48: Dredge tracks at small cones, ridges, and elongated seamounts along the northernmost profile across the Havre Trough (view from NNE to SSW). Stereo exaggeration, contours, and data sources as in figure 7.12.

Fig. 7.49: Moderately altered Fsp-Pyx phyric andesite from a fault scarp.

Fig. 7.50: Aphyric pillow lava with glassy margin and minor Pyx and Fsp phenocrysts.

Volcanic Front

A total of nine volcanic front stratovolcanos and areas with smaller seamount complexes have been sampled during SO255. They are all located west of the Kermadec Ridge and represent young, volcanically active edifices of the Kermadec Arc between ~34°30'S and ~30°S. The ultimate goal of the sampling was to obtain a representative, spatially distributed sample set of volcanic front lavas for comparison with Havre Trough back-arc volcanism to elucidate fundamental differences and possible commons between the two settings. In the following the SO255 sampling sites are summarized in a profile going from south to north.

Kibblewhite Complex (DR21 - 29)

The Kibblewhite Complex consists of a series of NNW-SSE aligned cones of which the central Kibblewhite Volcano is the largest (Fig. 7.51).

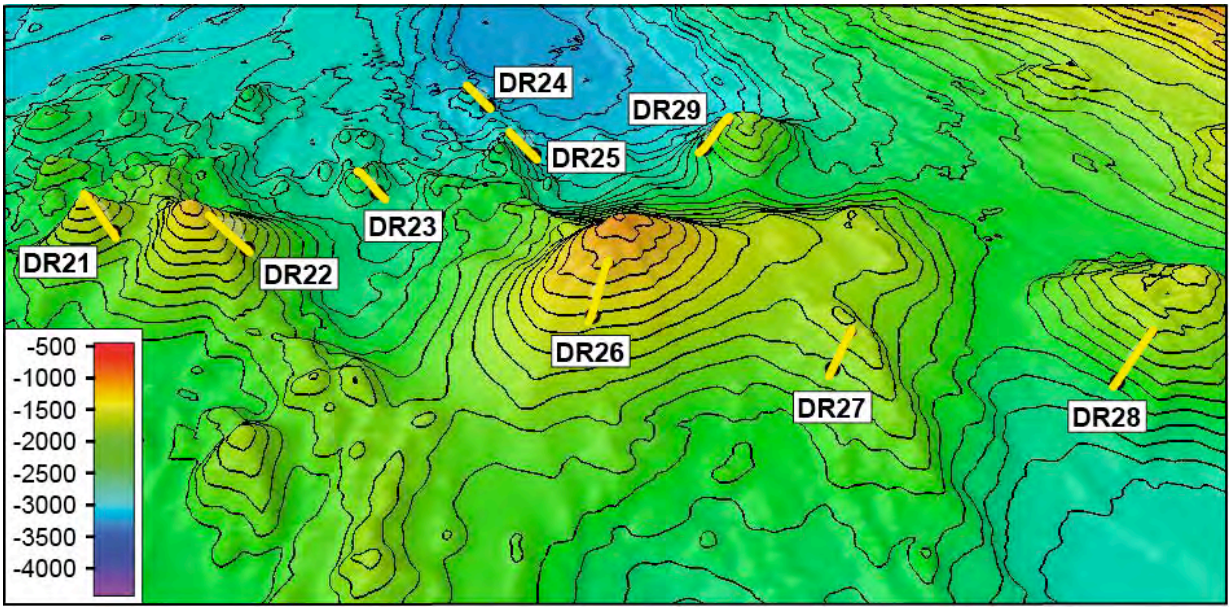

Fig. 7.51: Dredge tracks DR21 - 29 at Kibblewhite Complex with Kibblewhite Volcano in the center (view from SW to NE). Stereo exaggeration, contours, and data sources as in figure 7.12.

At DR21 (~1,800 - 1,400 m b.s.l.), the northernmost cone, a 3/4 full dredge returned with fresh, slightly phyric lava that has variable amounts of Ol-Pyx-Fsp and glassy margins in some samples (Fig. 7.52). SSE of here, DR22 (~1,800 - 1,400 m b.s.l.) obtained only a few rocks of fresh Pyx-Plg phyric lava with glassy margins from the southeastern flank of a larger cone. DR23 (~2,500 - 2,250 m b.s.l.) aimed at a comparatively small cone and returned a few rocks of slightly Pyx-Fsp and Pyx-Ol phyric lava. A small, elongated cone, located at the margin of a basin north of Kibblewhite was targeted at DR24 (~3,100 - 2,700 m b.s.l.). This site and DR25 (~2,900 - 2,500 m b.s.l.) lie on a SW-NE running fault / ridge that extends from Kibblewhite Volcano to the western margin of a basin. DR24 returned a single piece of near aphyric lava with a glassy margin and sub-percent amounts of Pyx and Fsp in the matrix. Similarly near aphyric Ol-Pyx lava with fresh glassy margins were obtained at DR25.

Fig. 7.52: Pyx+Ol phyric lava with glass from a cone at the Kibblewhite Complex.

Fig. 7.53: Ankaramitic pillow lava with fresh glassy margin and cm-sized Ol and Cr-diposide crystals.

The upper section of Kibblewhite Vocano along its western flank was sampled at DR26 (~1,500 - 1,550 m b.s.l.) and resulted in fresh, more evolved dacitic (?) lava with variable amounts of Plg, Amph and Qz. Samples -13 to -30 often contain xenoliths indicating complex magma reservoir processes for these more evolved melts. A NE-SW trending tectonic feature (rift?) extending south of Kibblewhite Volcano returned pumice of either local or distant origin at DR27 (~1,900 - 1,700 m b.s.l.). At the western lower flank of a medium-sized cone, DR28 (~2,200 - 1,850 m b.s.l.) returned fresh, very spectacular ankaramitic pillow lava with very large, cm-sized Ol-Pyx (Cr-Diopside) phenocrysts and abundant fresh glass rims (Fig. 7.53). The last site at DR29 (~2,300 - 1,950 m b.s.l.) obtained fresh andesitic lava with variable amounts of Ol-Fsp-Pyx and glassy rims (-2 to -9). Sample -1 includes a contact to a dacitic flow. Pyroxenite xenoliths and Ol-Pyx xenoliths were observed in -12 and -13, respectively. Samples 20 to -23 appear to be more evolved dacite with possible Hbl in places.

Sonne Volcano (DR180)

The last dredge of SO255 aimed at a ridge emanating towards southwest from Sonne Volcano at DR180 (~2,700 - 2,400 m b.s.l.) but returned empty.

Ngatoroirangi Volcano (DR171 – 173 and 176)

Sampling at Ngatoroirangi stratovolcano aimed at presumed eruption vents at the lower flanks of the edifice in the hopes of sampling mafic lavas. DR171 (~2,300 - 2,170 m b.s.l.) at the northern flank obtained three pieces of evolved andesitic to dacitic lava with an almost pumiceous appearance. Limited quantities of Plg-Pyx phyric basaltic lavas and a small piece of Plg-Pyx-Ol lava were received from DR171 (~2,000 - 1,900 m b.s.l.) at the northwestern flank of Ngatoroirangi. Andesitic to dacitic pumice were delivered from the base of the western flank at DR173 (~2,400 - 2,300 m b.s.l.). A small, morphologically separated cone south of Ngatoroirangi delivered fresh Ol-Pyx ±Plg phyric pillow lavas with glassy margins at DR176 (~2,150 - 1,900 m b.s.l., Fig. 7.54). To which extend this cone is part of the Ngatoroirangi volcanic system has to be shown by geochemistry, petrology and age.

Two unnamed volcanoes southwest of Kuiwai Volcano (DR169 and 170)

Two unnamed volcanoes at about midway between Ngatoroirangi and Kuiwai volcanoes at ~33°22'S and ~15 nm west of Kermadec Ridge were sampled. DR169 (~2,200 - 1,800 m b.s.l.) aimed at a circular shaped small cone along its northeastern flank in mid-section. Two units of fresh lava with glassy margins were identified; Ol-Pyx ± Fsp phyric pillow basalt (-1 to -10) and Fsp-Pyx ± Ol phyric lava (-11 to -16, Fig. 7.55). DR170 (~1,500 - 1,100 m b.s.l.) targeted the northwestern flank beneath the summit of the neighboring large volcano that has a characteristic NS-SW aligned ridge cutting across the edifice. Many large boulders of mainly Ol-Pyx phyric lava (-1 to -6) and a few smaller pieces of nearly aphyric lava were obtained.

Fig. 7.54: Ol-Pyx ±Fsp phyric pillow lava with chilled margin and fresh glass from a cone south of Ngatoroirangi stratovolcano.

Fig. 7.55: Fresh Fsp-Pyx ± Ol phyric lava from unnamed cone midway between Ngatoroirangi and Kuiwai volcanoes .

Kuiwai Volcano (DR165 - 167)

Kuiwai Volcano at 33°9'S / 179°57'E consists of two edifices, a smaller southwestern cone and a large central edifice that rises to ~500 m b.s.l. DR165 (~1,400 - 1,150 m b.s.l.) along the

western flank of the southwestern cone returned fresh Ol-Pyx ± Fsp bearing lava with abundant glassy margins that are also full of Ol and Pyx crystals (Fig. 7.56). The lower section of the large central edifice was aimed at DR166 (~1,700 - 1,450 m b.s.l.) along its southeastern flank. Within the various pillow lava fragments basically two groups were identified: (1) a more Pyx-Ol phyric goup with fresh glassy margins and (2) an aphyric group without glass and with some pieces being fairly dense. The summit of Kuiwai was sampled by DR167 (~1,700 - 1,450 m b.s.l.) and returned a ¾ full dredge of lava and hydrothermal material. The lava group is subdivided into (1) Plg+Pyx phyric, vesicular lava with occasional glassy margins (-1 through -6) and (2) a more dense, bit less Plg+Pyx phyric group (-7 through -9). The hydrothermal group (-10 through -21) consists of variably altered / mineralized lava fragments (Fig. 7.57), hydrothermal sediments, and mineralizations that includes a large baryte growing on a lava fragment (-18).

Fig. 7.56: Ol-Pyx-Fsp phyric lava from a cone of Kuiwai Volcano.

Fig. 7.57: Hydrothermally overprinted Fsp-Pyx phyric lava from the summit of Kuiwai Volcano.

Haungaroa Volcano (DR141 & 142)

Haungaroa Volcano was sampled along its lower E flank at DR141 (~1,800 - 1,550 m b.s.l.) and returned fresh, near aphyric sheet flow lava with sometimes glassy margins and very minor Pyx phenocryts (Fig. 7.58). The uppermost section just below the top of the cone returned a compositionally uniform dredge of fresh, slightly Pyx-Plg phyrirc lava at DR142 (~1,000 - 750 m b.s.l.) and most likely sampled a single flow.

Fig. 7.58: Near aphyric lava from Haungaroa Volcano.

Fig 7.59: Plg-Pyx±Ol phyric lava from a SW-NE ridge / cone structure west of Kermadec Ridge.

Fig 7.60: Highly Fsp phyric lava a larger cone northeast of Havre Volcano. Note sponge growing on lava.

Unnamed volcano directly west of Kermadec Ridge (DR133)

This structure is located on a SW-NE striking rift and therefore it is a bit unclear if it belongs to the volcanic arc or is part of the rifting that affected the nearby eastern slope of the Kermadec Ridge. DR133 (~2,200 - 1,800 m b.s.l.) returned fresh lava fragments with variable proportions of Plg and Pyx and occasional Ol (Fig. 7.59).

Unnamed volcano northeast of Havre Volcano (DR124)

This seamount is located ~7 nm northeast of Havre Volcano and DR124 (~1,150 - 800 m b.s.l.) has been carried along the southern slope beneath the summit. A full dredge of fresh, highly Plg phyric lava fragments (-1 to -11, Fig. 7.60) along with significantly less phyric, more dense lava (-12 & -13) has been obtained.

Giggenbach Volcanic Field (DR55, 56, 58 - 60 and 117)

The Giggenbach Volcanic Field consists of five large cones and numerous small ridges and cones in its western section (Fig. 7.61). All emerge from a ~1,500 m b.s.l. plateau with the large cones reaching less than 200 m b.s.l.

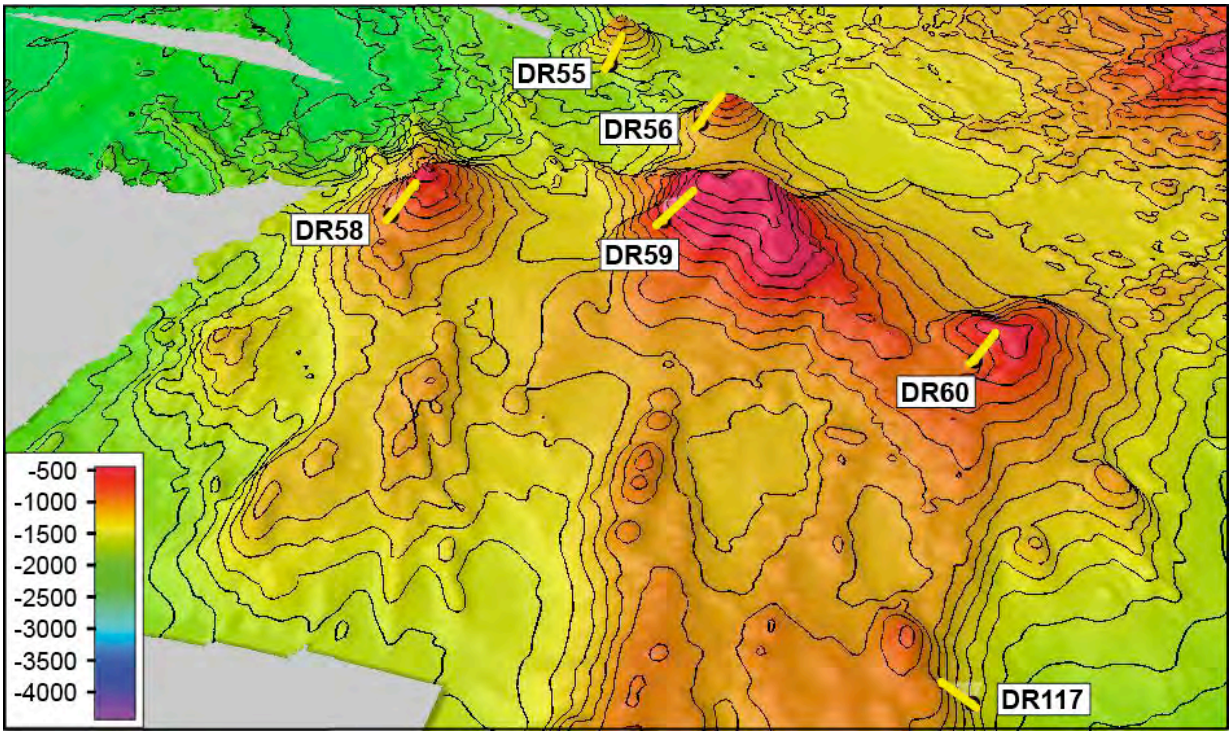

Fig. 7.61: Dredge tracks DR55, 56, 58 - 60, and 117 at Giggenbach Volcanic Field (view from WSW to ENE). Stereo exaggeration, contours, and data sources as in figure 7.12.

The easternmost cone was sampled along its western flank at site DR55 (~1,550 - 1,250 m b.s.l.) and returned abundant fresh Plg-Pyx phyric pillow lava with glassy margins (Fig. 7.62). The cone immediately east of the large central edifice provided lots of highly Plg phyric pillow lava with fresh glass from the northwestern slope, beneath the summit at DR56 (~1,050 - 700 m b.s.l.). The cone north of the large central cone was targeted at DR58 (~870 - 640 m b.s.l.) along a NE-SW striking ridge (rift zone?) on the northwestern flank beneath the summit. The dredge returned a heterolithological suite of volcanics ranging from highly porphyric Pyx > Fsp (e.g. -1 to -6, Fig. 7.63), Fsp > Pyx (-9 to -10) over Fsp-Pyx in equal amounts (-11 to -14) to near aphyric lava (-15 to -18). In addition mafic and silicic pumice of local origin (?) was also obtained. Notably a leucocratic gabbro (-30) was also found. The remaining Giggenbach sites at the central cone, (DR59, ~600 - 250 m b.s.l.), the cone south of it (DR60, ~800 - 250 m b.s.l.) and the southern margin of the Giggenbach plateau (DR117, ~1,400 - 1,050 m b.s.l.) returned mainly pumice of possible local origin. Only at DR117 four pieces of dense, obsidian like rhyolite similar to those from DR115 at the caldera volcano further west were recovered.

Fig. 7.62: Pyx-Fsp phyric lava with glassy margin from the easternmost Giggenbach cone.

Fig. 7.63: Fresh, vesicular Pyx > Fsp phyric lava from Giggenbach Volcanic Field.

7.1.2.3 Volcanology

Sampling for volcanology purposes was focused on felsic pumice clasts and sediment (Table 7.1). Pumice clasts were dredged at most locations throughout the entire expedition, but were mostly collected in the frontal arc area. Recovered pumice clasts reach up to 60 cm in size, and vary widely in textures. Many pumice clasts show rim-to-core variations in vesicularity, and quenched rims are present in some clasts. Pumice clasts are chiefly sub-rounded to rounded, although quenched margins are angular. Color ranges from white, yellowish white, light to dark grey, brown and black; color changes reflect composition, vesicularity, and/or alteration intensity. Textures, such as flow bands, cracks and joints, vesicularity, and content in xenoliths vary widely, and allow grouping of pumice in broad types. The pumice vesicularity varies either through flow banding, or by rim-to-core gradations. Quenched rims contain very small vesicles, whereas cores commonly include both small and large, coalesced vesicles. Pervasive cracks and poorly developed columnar joints are common, and form clasts with concave shapes. Phenocrysts (feldspar, pyroxene, amphibole), suggest andesite and dacite compositions; no quartz was identified with certainty. Alteration ranges from absent to pervasive, and some pumice clasts can be easily crushed by the finger, and crumble when brushed. The most altered pumice clasts are commonly brown in color. Manganese encrustations are present in some clasts, but commonly affect a single side, or embayments in the clast. Algae growth on some pumice clasts produce a yellowish tinge to the clast's exterior. Biota encrustations with deep-sea corals and sponges are uncommon.

The 2012 deep submarine eruption at Havre Volcano (31°S, 179°E) produced a gigantic pumice raft that drifted northeast from the volcano over the few weeks after the eruption. Havre pumice could be identified from dredges, however several clasts remain of unclear origin, and geochemistry will be needed to assign them a provenance.

Volcanogenic sediment captured by sediment traps include variable amount of rounded to angular pumice clasts, crystal fragments and mafic to felsic glass shards. A few basaltic to felsic lavas and clasts were sampled for vesicularity studies (Table 7.1). Basaltic glass shards are much less frequent than felsic ones, however Limu o' Pele was recovered in a few instances.

Table 7.1: Samples taken on cruise SO255 for volcanology purposes.

Sediment		Pumice	Hard Rocks
SO255-ML-20	SO255-ML-121	SO255-ML-5-13	SO255-ML-12-2
SO255-ML-22	SO255-ML-121_2	SO255-ML-6-1	SO255-ML-15-3
SO255-ML-23	SO255-ML-121_3	SO255-ML-15-5	SO255-ML-17
SO255-ML-26	SO255-ML-122	SO255-ML-26	SO255-ML-19-9
SO255-ML-29	SO255-ML-123	SO255-ML-27	SO255-ML-20
SO255-ML-29_2	SO255-ML-123	SO255-ML-28	SO255-ML-21-22
SO255-ML-35-37	SO255-ML-124	SO255-ML-29	SO255-ML-25-1
SO255-ML-35	SO255-ML-124_2	SO255-ML-58-23	SO255-ML-26
SO255-ML-37-2	SO255-ML-125	SO255-ML-58-26	SO255-ML-28
SO255-ML-37-6	SO255-ML-125_2	SO255-ML-59	SO255-ML-30
SO255-ML-39	SO255-ML-126	SO255-ML-60	SO255-ML-37-7
SO255-ML-43	SO255-ML-127	SO255-ML-64	SO255-ML-54-6
SO255-ML-44	SO255-ML-128	SO255-ML-65	SO255-ML-54-7
SO255-ML-55	SO255-ML-128	SO255-ML-66	SO255-ML-55
SO255-ML-65	SO255-ML-130	SO255-ML-67	SO255-ML-58
SO255-ML-66	SO255-ML-131	SO255-ML-68	SO255-ML-62
SO255-ML-67	SO255-ML-132	SO255-ML-69	SO255-ML-109
SO255-ML-68	SO255-ML-133	SO255-ML-70	SO255-ML-112
SO255-ML-69	SO255-ML-134	SO255-ML-74	SO255-ML-127
SO255-ML-70	SO255-ML-135	SO255-ML-74	SO255-ML-129
SO255-ML-72	SO255-ML-136	SO255-ML-75	SO255-ML-137
SO255-ML-74	SO255-ML-137	SO255-ML-78	SO255-ML-156
SO255-ML-76	SO255-ML-138	SO255-ML-88	SO255-ML-162_2
SO255-ML-78	SO255-ML-140	SO255-ML-89	SO255-ML-165
SO255-ML-83	SO255-ML-142	SO255-ML-90	SO255-ML-167
SO255-ML-85	SO255-ML-144	SO255-ML-91	
SO255-ML-86	SO255-ML-145	SO255-ML-92	
SO255-ML-87	SO255-ML-146	SO255-ML-93	
SO255-ML-88	SO255-ML-147	SO255-ML-94	
SO255-ML-89	SO255-ML-148	SO255-ML-96	
SO255-ML-90	SO255-ML-149	SO255-ML-101	
SO255-ML-91	SO255-ML-150	SO255-ML-102	
SO255-ML-92	SO255-ML-151	SO255-ML-103	
SO255-ML-93	SO255-ML-152	SO255-ML-110	
SO255-ML-94	SO255-ML-153	SO255-ML-112	
SO255-ML-94	SO255-ML-154	SO255-ML-115	
SO255-ML-95	SO255-ML-155	SO255-ML-116	
SO255-ML-96	SO255-ML-156	SO255-ML-117	
SO255-ML-99	SO255-ML-157	SO255-ML-118	
SO255-ML-101	SO255-ML-159	SO255-ML-122	
SO255-ML-102	SO255-ML-162	SO255-ML-123	
SO255-ML-103	SO255-ML-165	SO255-ML-124	
SO255-ML-104	SO255-ML-166	SO255-ML-125	
SO255-ML-104	SO255-ML-166	SO255-ML-126	
SO255-ML-105	SO255-ML-168	SO255-ML-127	
SO255-ML-106	SO255-ML-169	SO255-ML-127	
SO255-ML-106	SO255-ML-170	SO255-ML-133	
SO255-ML-107	SO255-ML-172	SO255-ML-138	
SO255-ML-109	SO255-ML-173	SO255-ML-148	
SO255-ML-110	SO255-ML-174	SO255-ML-150	
SO255-ML-112	SO255-ML-175	SO255-ML-151	
SO255-ML-113	SO255-ML-176	SO255-ML-153	
SO255-ML-114	SO255-ML-177	SO255-ML-162	
SO255-ML-115	SO255-ML-178	SO255-ML-166	
SO255-ML-118	SO255-ML-179	SO255-ML-170	
SO255-ML-119	SO255-ML-180	SO255-ML-175	
SO255-ML-120			

7.2 ZOOPLANKTON SAMPLING

D. Wall-Palmer

7.2.1 Methods

Zooplankton was collected using a single ring net with an aperture diameter of 1 m and a mesh size of 350 µm. Sampling was conducted in two ways; vertical hauls and oblique tows. Both were optimized for the sampling of planktonic gastropods by sampling at night and hauling or towing the net at a fairly fast speed. A General Oceanics flow meter was suspended at the mouth of the net to determine the water volume sampled. For vertical hauls, the net was lowered to 200 m and then hauled in at 0.5–0.7 m/s, sampling around 150 m^3 of water. For oblique tows, the net was lowered to 100 m and towed at 1.5–2 kn for around 15 minutes before being hauled in at 0.7 m/s. This technique sampled around 1,600 m^3 of water (Table 7.2).

Within one hour of sampling, a selection of planktonic gastropods were sorted from the sample and introduced into experimental tanks. The remaining bulk zooplankton samples were fixed in 96% ethanol and frozen (within one hour of sampling), and the ethanol was changed within 24 hours to ensure excellent preservation for molecular analyses of target organisms. The preserved samples were sorted for all gastropods and cephalopods. Ostracods and foraminifera were also sorted from some samples. Sorted samples will be transported frozen and used for molecular and morphological analysis.

Two experiments were conducted on the live sorted planktonic gastropods. Firstly the potential for keeping atlantid heteropods in laboratory conditions was investigated using several different tank systems. Adult specimens were offered a range of zooplankton as prey. Secondly, a pilot investigation into the effects of ocean acidification was carried out by maintaining specimens in waters of 793 ppm CO_2 and ~385 ppm CO_2 for four days. The guide to best practices for ocean acidification research (Fabry et al. 2010) was adhered to as closely as possible. Acidification was achieved by bubbling seawater with a mixture of air and CO_2. Temperature was maintained at 22°C in a climate controlled laboratory. Following the experiments, specimens were preserved in 96% ethanol for future imaging and analysis.

Sediment samples were retrieved from the sediment catchers within the rock dredge. These consisted of four cylinders of 4 cm diameter and 25 cm length. Sediment was not collected at every station (Table 7.3). Once collected, the sediment was washed over a 90 µm, 250 µm or 1 mm sieve and dried in an oven at 65°C. The fossil content of the sediment will be investigated in future analysis and will join collections at the Naturalis Biodiversity Center, Leiden.

Table 7.2: Summary of zooplankton sampling. Local time for samples is UTC+13, except for Net 143, which is UTC +12 due to the time change in New Zealand.

Station	Type	Start		End		Time (local)		Date (local)	Surface water temp. (°C)	Surface salinity (PSU)	Towing/ hauling speed (kn)	Max. depth (m)	Volume of water (m^3)
		Lat.	Long.	Lat.	Long.	Start	End						
NET13	Vertical haul	-34.54	178.51	NA	NA	10:04	10:10	07/03/17	22.1	35.8	1	200	157.08
NET41	Vertical haul	-34.27	-178.87	NA	NA	02:06	02:13	13/03/17	22.7	35.82	1	200	157.08
NET57	Vertical haul	-29.95	-178.73	NA	NA	04:44	04:50	18/03/17	24.3	35.83	1.4	200	157.08
NET73	Oblique tow	-28.13	179.02	-28.13	179.01	10:05	10:31	21/03/17	25.2	35.86	1.5-2	100	1613
NET80	Oblique tow	-29.10	-179.72	-29.11	-179.72	04:37	05:06	23/03/17	24.9	35.74	1.5-2	100	1610
NET100	Oblique tow	-28.52	179.59	-28.51	179.59	03:49	04:14	27/03/17	25.3	35.75	1.5	100	1487
NET143	Oblique tow	-32.87	-179.78	-32.88	-179.79	05:16*	05:41	03/04/17	23.7	35.53	1.5-2	100	1703

Table 7.3: Summary of sediment sampling.

Dredge	Start		Finish		Date (UTC)	Depth (m)		Size fraction saved	Notes
	Lat.	Long.	Lat.	Long.		Min	Max		
DR 2	-33.56	178.59	-33.56	178.90	04/03/17	2180	2540	>250 µm	Foraminifera rich
DR 9	-34.31	178.40	-34.31	178.40	06/03/17	3134	3542	>90 µm	Foraminifera rich
DR 12	-34.65	178.38	-34.64	178.38	06/03/17	2094	2482	>90 µm	Foraminifera rich
DR 15	-34.42	178.59	-34.41	178.58	07/03/17	2504	2965	>90 µm	Foraminifera rich
DR 29	-34.57	179.34	-34.57	179.34	09/03/17	1948	2301	>90 µm	Foraminifera rich
DR 30	-34.55	179.48	-34.55	179.49	09/03/17	1720	2235	>90 µm	Foraminifera rich
DR 31	-34.49	179.48	-34.48	179.49	09/03/17	2330	2670	>90 µm	Foraminifera rich
DR 52	-29.87	-178.33	-29.88	-178.33	16/03/17	1100	1608	>90 µm	Foraminifera rich
DR 56	-30.01	178.65	-30.02	178.64	17/03/17	694	1050	>90 µm	Foraminifera rich
DR 65	-28.37	-178.07	-28.38	-178.07	19/03/17	877	1193	>1 mm	Planktonic gastropod and foram rich
DR 76	-28.02	-179.77	-28.03	-179.77	21/03/17	877	1018	>1 mm	Planktonic gastropod and foram rich
DR 78	-28.50	-179.60	-28.51	-179.60	21/03/17	1002	1372	>1 mm	Planktonic gastropod and foram rich
DR 85	-30.21	179.76	-30.21	179.76	24/03/17	755	1200	>1 mm	Planktonic gastropod and foram rich
DR 86	-30.22	179.76	-30.21	179.76	24/03/17	1163	1510	>1 mm	Planktonic gastropod and foram rich
DR 89	-29.59	-179.77	-29.59	-179.77	24/03/17	844	1013	>1 mm	Planktonic gastropod and foram rich
DR 91	-29.33	179.94	-29.28	179.94	25/03/17	787	1111	>1 mm	Planktonic gastropod and foram rich
DR 94	-28.96	-179.65	-28.96	-179.64	25/03/17	783	1103	>1 mm	Planktonic gastropod and foram rich
DR 95	-28.95	-179.56	-28.95	-179.56	25/03/17	968	1402	>90 µm	Foraminifera rich
DR 96	-28.70	-179.65	-28.70	-179.65	26/03/17	1305	1426	>90 µm	Planktonic gastropod and foram rich
DR 97	-28.59	-179.69	-28.59	-179.69	26/03/17	1015	1210	>1 mm	Planktonic gastropod and foram rich
DR 98	-28.57	-179.67	-28.57	-179.67	26/03/17	710	1034	>90 µm	Planktonic gastropod and foram rich
DR 99	-28.53	-179.60	-28.53	-179.60	26/03/17	1097	1217	>90 µm	Planktonic gastropod and foram rich
DR 101	-28.55	-179.65	-28.55	-179.65	26/03/17	708	879	>90 µm	Planktonic gastropod and foram rich
DR 102	-28.83	-178.87	-28.83	-178.87	26/03/17	1843	2131	>90 µm	Foraminifera rich
DR 103	-28.91	-178.87	-28.91	-178.87	27/03/17	1825	2168	>90 µm	Foraminifera rich
DR 104	-28.97	-178.74	-28.96	-178.74	27/03/17	1291	1609	>90 µm	Foraminifera rich
DR 105	-28.99	-178.54	-28.98	-178.54	27/03/17	1916	2211	>90 µm	Foraminifera rich
DR 106	-29.13	-178.28	-29.13	-178.28	27/03/17	844	1153	>90 µm	Planktonic gastropod and foram rich
DR 107	-29.16	-178.43	-29.15	-178.43	27/03/17	1505	1791	>90 µm	Foraminifera rich
DR 110	-29.91	-178.85	-29.91	-178.86	28/03/17	1516	1832	>90 µm	Foraminifera rich
DR 112	-29.90	-179.02	-29.90	-179.03	28/03/17	1040	1319	>90 µm	Foraminifera rich
DR 114	-29.86	-179.28	-29.86	-179.29	29/03/17	2110	2410	>90 µm	Foraminifera rich
DR 115	-29.93	-179.04	-29.93	-179.04	29/03/17	1260	1618	>90 µm	Foraminifera rich
DR 117	-30.10	-179.83	-30.09	-179.83	29/03/17	1069	1432	>90 µm	Foraminifera rich
DR 118	-30.40	-179.36	-30.40	-179.36	29/03/17	1373	1715	>90 µm	Foraminifera rich
DR 119	-30.33	-179.45	-30.33	-179.45	29/03/17	1833	2168	>90 µm	Foraminifera rich
DR 125	-31.03	-178.74	-31.02	-178.74	30/03/17	504	883	>90 µm	Planktonic gastropod and foram rich
DR 126	-31.61	-178.87	-31.61	-178.86	31/03/17	872	1217	>90 µm	Planktonic gastropod and foram rich
DR 127	-31.70	-178.93	-31.70	-178.92	31/03/17	910	1300	>90 µm	Foraminifera rich
DR 128	-31.78	-179.04	-31.78	-179.03	31/03/17	1933	2314	>90 µm	Foraminifera rich
DR 130	-31.68	-179.02	-31.69	-179.01	31/03/17	2091	2395	>90 µm	Foraminifera rich
DR 131	-31.86	-179.06	-31.86	-179.06	31/03/17	1730	2040	>90 µm	Foraminifera rich
DR 132	-31.98	-179.11	-31.86	-179.10	01/04/17	1635	1910	>90 µm	Foraminifera rich
DR 133	-32.09	-179.27	-32.09	-179.26	01/04/17	1830	2230	>90 µm	Foraminifera rich
DR 134	-32.30	-179.29	-32.30	-179.28	01/04/17	2753	2954	>90 µm	Foraminifera rich
DR 136	-32.36	-179.22	-32.36	-179.21	01/04/17	972	1180	>90 µm	Planktonic gastropod and foram rich

7.2.2 Zooplankton Results

A total of three vertical hauls and four oblique plankton tows were made in the area of 28.13°S–34.54°S, 178.51°E–78.73°W (Table 7.2). Two vertical hauls (Net 13 and Net 41) were not successful, retrieving a maximum of three planktonic gastropod species only. The remaining net samples caught 20 - 29 planktonic gastropod species. The highest abundance of planktonic gastropods was reached in Net 143, with 1.89 specimens per cubic meter of seawater sampled (Fig. 7.64). Pteropods were more abundant than heteropods at all stations, however diversity (number of species) was comparable between the two groups.

Sampling was found to be more affective at night for both vertical hauls and oblique tows (Fig. 7.64, Table 7.2). The number of planktonic gastropod specimens caught per cubic meter of water sampled was 2.5 and 3.2 times higher for night sampling compared to day sampling for the two techniques respectively. This agrees diurnal migratory patterns for planktonic gastropods proposed by several authors (Lalli and Gilmer 1989; Wall-Palmer et al. 2016 and references within).

A total of 18 pteropod species and 19 heteropod species were collected. These will be used for future morphological and molecular analysis to investigate the taxonomy, biogeography and evolution of planktonic gastropods.

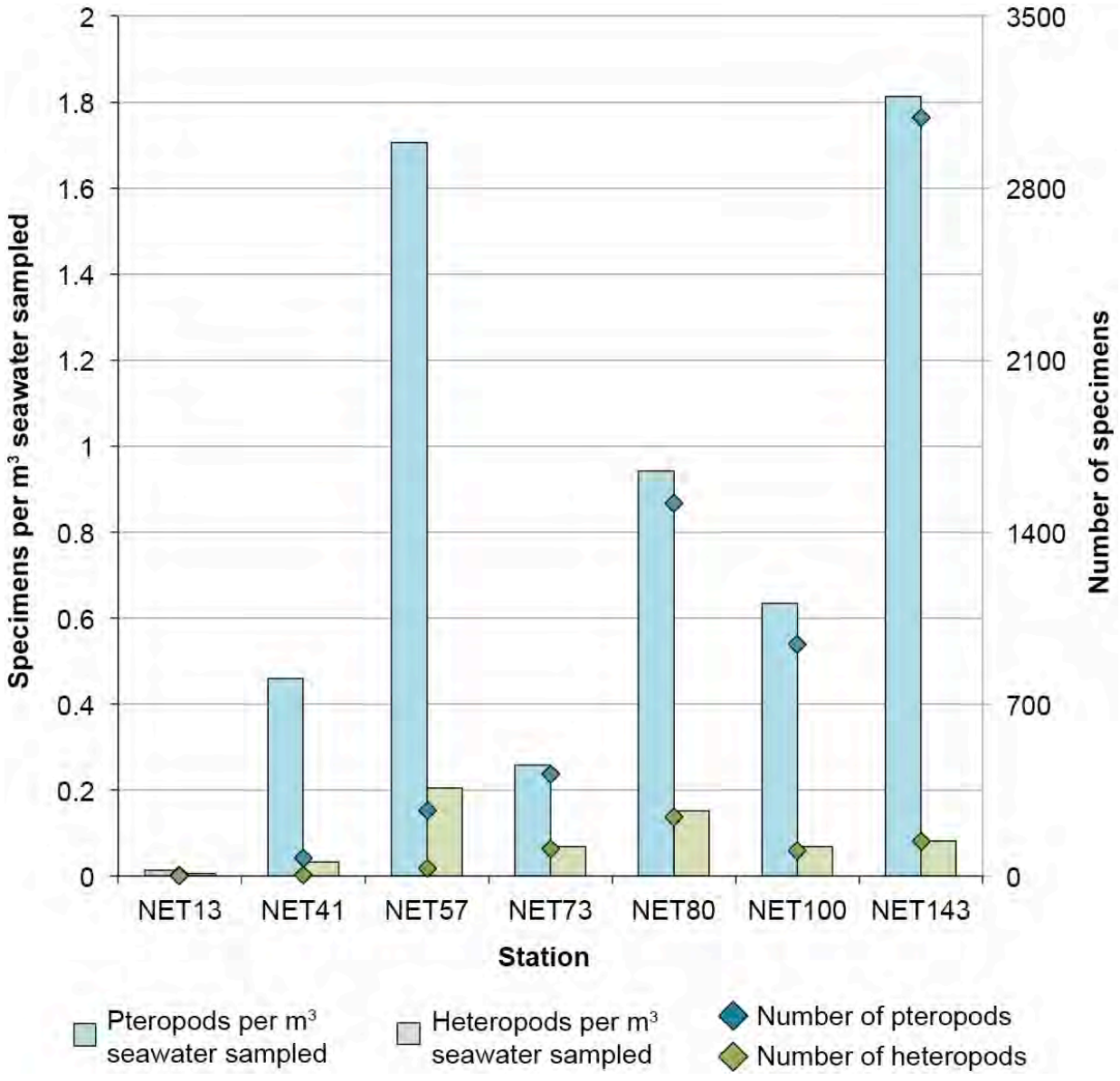

Fig. 7.64: Abundance of planktonic gastropods caught in zooplankton sampling.

7.3 BIOLOGICAL OCEANOGRAPHY

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7.3.1 Underway sampling of the surface ocean from shipboard surface pump (approx. 5 m depth)

Thirty-seven samplings were conducted along the cruise track (Fig. 7.65), during which seawater was sampled from the shipboard underway pump every day while steaming faster than 2 kn. Samples were processed for different parameters as described below (Table 7.4) and will be analyzed at GEOMAR. The collected data will be combined with continuous measurements of surface seawater and air temperature by the ship's weather station which were extracted from the data management system DSHIP V3 (Werum software & systems).

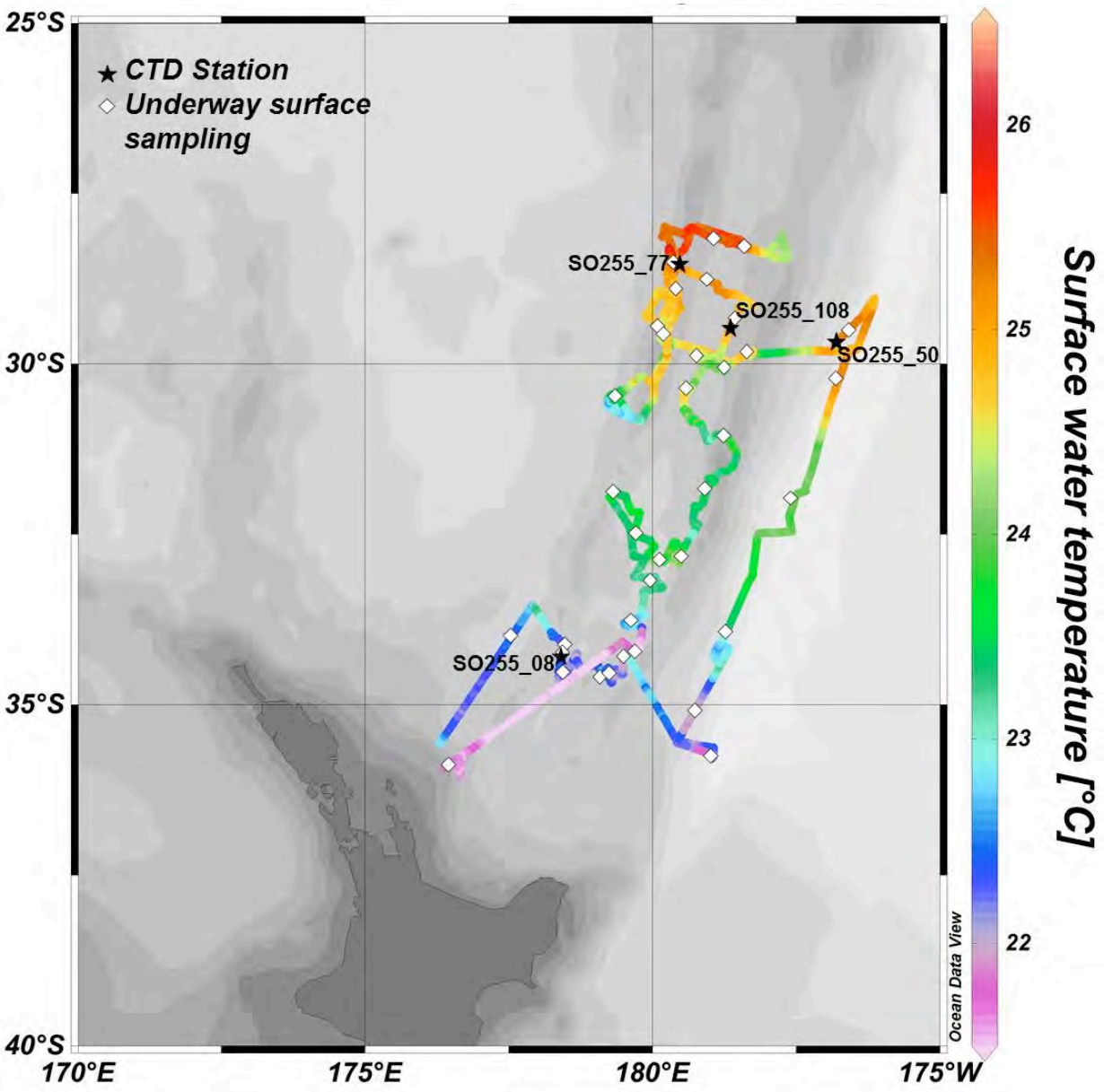

Fig. 7.65: Sampled CTD stations, underway stations and sea surface temperature along SO255 cruise track (details in Tables 7.4 and 7. 5).

Table 7.4: Sampled underway stations during SO255, including parameters that will be analyzed from each sample.

Cruise	#	Date (UTC)	Time (UTC)	Water Temp [°C]	Depth [m]	Latitude (deg)	Longitude (deg)	Total organic matter	Particulate organic matter	Gel particles	Carbohydrates, amino acids, C/FDOM	Nutrients	Cell abundances
SO255	1	04/03/2017	19:50	22.4	6	33° 58.512'S	177° 34.108'E	x	x	x	x	x	x
SO255	2	05/03/2017	19:34	22.1	6	34° 6.051'S	178° 27.383'E	x	x	x	x	x	x
SO255	3	06/03/2017	02:58	22.1	6	34° 13.959'S	178° 26.963'E	x	-	-	x	x	x
SO255	4	06/03/2017	20:23	22.1	6	34° 34.02'S	178° 28.406'E	x	x	x	x	x	x
SO255	5	07/03/2017	22:13	22.3	6	34° 36.495'S	179° 5.534'E	x	x	x	x	x	x
SO255	6	08/03/2017	19:28	22.0	6	34° 33.233'S	179° 16.23'E	x	x	x	x	x	x
SO255	7	09/03/2017	22:01	22.4	6	34° 17.255'S	179° 31.222'E	x	x	x	x	x	x
SO255	8	11/03/2017	00:19	22.1	6	35° 44.638'S	178° 56.933'E	x	x	x	x	x	x
SO255	9	11/03/2017	23:04	21.9	6	35° 4.917'S	179° 15.756'W	x	x	x	x	x	x
SO255	10	12/03/2017	19:46	23.0	6	33° 55.708'S	178° 4.551'W	x	x	x	x	x	x
SO255	11	13/03/2017	20:00	23.8	6	31° 58.842'S	177° 31.241'W	x	x	x	x	x	x
SO255	12	14/03/2017	19:49	25.0	6	30° 10.803'S	176° 44.048'W	x	x	x	x	x	x
SO255	13	16/03/2017	01:52	25.0	6	29° 29.588'S	176° 34.374'W	x	x	x	x	x	x
SO255	14	17/03/2017	00:40	24.4	6	29° 51.140'S	178° 18.589'W	x	x	x	x	x	x
SO255	15	17/03/2017	21:40	23.8	6	30° 4.156'S	178° 44.239'W	x	x	x	x	x	x
SO255	16	18/03/2017	22:09	25.2	6	28° 16.505'S	178° 21.195'W	x	x	x	x	x	x
SO255	17	20/03/2017	01:29	25.2	6	28° 17.586'S	178° 21.434'W	x	x	x	x	x	x
SO255	18	20/03/2017	20:14	25.1	6	28° 9.016'S	178° 53.805'W	x	x	x	x	x	x
SO255	19	22/03/2017	00:40	24.9	6	28° 31.038'S	179° 36.212'W	x	x	x	x	x	x
SO255	20	22/03/2017	20:10	24.3	6	29° 33.133'S	179° 48.636'W	x	x	x	x	x	x
SO255	21	23/03/2017	20:07	23.2	6	30° 29.257'S	179° 23.806'E	x	x	x	x	x	x
SO255	22	25/03/2017	02:30	24.6	6	29° 27.436'S	179° 53.264'W	x	x	x	x	x	x
SO255	23	25/03/2017	22:29	24.7	6	28° 54.917'S	179° 34.130'W	x	x	x	x	x	x
SO255	24	26/03/2017	20:24	25.1	6	28° 45.860'S	179° 3.777'W	x	x	x	x	x	x
SO255	25	27/03/2017	21:43	24.9	6	29° 18.999'S	178° 32.688'W	x	x	x	x	x	x
SO255	26	28/03/2017	22:47	24.5	6	29° 51.517'S	179° 10.415'W	x	x	x	x	x	x
SO255	27	29/03/2017	19:37	24.5	6	30° 20.620'S	179° 26.388'W	x	x	x	x	x	x
SO255	28	30/03/2017	22:00	23.2	6	31° 3.054'S	178° 17.190'W	x	x	x	x	x	x
SO255	29	31/03/2017	20:01	23.1	6	31° 50.487'S	179° 3.291'W	x	x	x	x	x	x
SO255	30	01/04/2017	23:24	24.1	6	32° 48.313'S	179° 30.117'W	x	x	x	x	x	x
SO255	31	02/04/2017	21:26	23.5	6	32° 53.011'S	179° 50.501'W	x	x	x	x	x	x
SO255	32	04/04/2017	00:02	23.6	6	32° 27.4435'S	179° 41.871'E	x	x	x	x	x	x
SO255	33	05/04/2017	0.063	23.5	6	31° 52.866'S	179° 20.632'E	x	x	x	x	x	x
SO255	34	07/04/2017	0.91	23.1	6	33° 10.412'S	179° 56.916'E	x	x	x	x	x	x
SO255	35	08/04/2017	0.889	22.7	6	33° 45.817'S	179° 40.771'E	x	x	x	x	x	x
SO255	36	09/04/2017	0.86	21.3	6	34° 12.288'S	179° 40.351'E	x	x	x	x	x	x
SO255	37	10/04/2017	0.869	21.7	6	35° 53.184'S	176° 27.948'E	x	x	x	x	x	x

7.3.2 Sampling of the water column by CTD/rosette sampler

Seawater was collected by CTD/rosette sampler at four stations along the cruise track (Fig. 7.65) to determine the impact of microbial processes on organic matter cycling. Water was sampled from about 7-10 depths down to 4,000 m for microbial and biogeochemical parameters (Table 7.5).

Table 7.5: Sampled CTD stations and depths during SO255, including parameters that will be analysed from each sample.

Stationbook No.	Latitude	Longitude	Date and Time (UTC)	Sampled depths [m]	Total organic matter	Particulate organic matter	Gel particles	Carbohydrates, amino acids, C/FDOM	Nutrients	Cell abundances	Bacterial community composition
SO255_08	34° 13.952'S	178° 26.957'E	06/03/2017 00:11	5, 52, 86, 122, 183, 303, 503, 999, 2005, 3505	x	x	x	x	x	x	x
SO255_50	29° 41.960'S	176° 49.054'W	16/03/2017 03:57	5, 40, 101, 132, 163, 355, 502, 1004, 2008, 4005	x	x	x	x	x	x	x
SO255_77	28° 30.138'S	179° 35.728'W	21/03/2017 19:44	2, 27, 52, 102, 127, 152, 202	x	x	x	x	x	x	x
SO255_108	29° 25.631'S	178° 37.463'W	27/03/2017 22:35	5, 40, 68, 95, 110, 131, 202	x	x	x	x	x	x	x

7.3.3 Determination of biogeochemical parameters

To investigate the elemental stoichiometry of the organic matter (OM), a total of 71 samples for each total and particulate organic carbon (TOC, POC), nitrogen (TN, PON) and phosphorous (TP, POP) were collected from underway sampling and CTD stations. TOC and TN will be analyzed using the high-temperature combustion method (TOC-VCSH, Shimadzu) (Qian and Mopper 1996). Total and particulate phosphorous will be oxidized with peroxodisulfate solution and analyzed spectrophotometrically as phosphate (Grasshoff et al. 1983).

The composition of particulate organic matter that is formed in the photic zone and is transported below the mixed layer depends not just on their source in the surface waters, but also on alteration, supplementation, and selective removal, that occurs during vertical transit. Subsamples were filtered on board for analysis of particulate organic carbon and nitrogen (POC/PN), particulate organic phosphorous (POP), and Chlorophyll-a (Chl-a).

Carbohydrates and amino acids proved valuable to trace biological production and decomposition processes in response to e.g. nutrient input and temperature. Highly sensitive IC- and HPLC-techniques will be applied to analyze concentrations and compositions of total amino acids (TAA) and carbohydrates (TCHO) in the OM. Amino acids and carbohydrates are rather indicative of recent biological production, while chromophoric and fluorescent dissolved organic matter (C/FDOM) seems to accumulate over longer time scale and displays a more conservative behaviour (Coble 2007). During SO255, at total of 71 of each TCHO, TAA, C/FDOM and nutrients samples were collected for silicate, phosphate, nitrate and nitrite analysis. Samples were frozen at -20°C until further analysis in the home laboratory.

Two classes of gel particles, transparent exopolymer particles (TEP) and Coomassie-stainable particles (CSP), will be determined microscopically using semi-automated image analysis (Engel 2009).

Microbial colonization onto gel particles can by visualized by Confocal Laser Scanning Microscopy. In total, 71 samples have been collected during the cruise and will be analyzed using DNA and polysaccharide specific fluorescent probes.

7.3.4 Determination of biological parameters

At each station and depth, samples were taken for the analyses of bacterial and phytoplankton cell abundance via Flow Cytometry. Therefore, 1.7 mL sample were fixed with 85 µ L 25% Glutardialdehyde (GDA). In addition, 1L seawater was filtered for analysis for Chlorophyll-a (Chl-a) concentrations. These data will enable a detailed description of the vertical distribution of those organisms. Furthermore, to study the microbial community, at

each CTD cast, the surface, the above and below the deep chlorophyll maximum (DCM) as well as the DCM were sampled for genetic analyses of bacterial DNA.

7.3.5. Incubation experiments

A possible reason for slow turn-over of deep sea OM could be the low DOC concentrations in the deep sea as compared to surface waters. Therefore, increasing the DOC concentration should stimulate OM turn-over (Hypothesis 1). Alternatively, the complex molecular composition of deep sea OM could cause its refractory characteristics. In this case, the addition of labile and less complex OM should stimulate the deep-sea OM turn-over (Hypothesis 2). In order to test both hypotheses, two incubation studies were performed on board.

Water samples from the deep sea (3,500 and 4,000 m) were taken at two stations (SO255_08, SO255_50) and incubated without head-space in gas-tight bottles in the dark and under *in-situ* temperature conditions (2-3°C) for 22-30 days.

Treatment 1: In order to test, whether increasing concentrations of refractory DOM will stimulate bacterial processing of the OM (Hypothesis 1), 100 L deep sea water were ultra-filtered (10 kDa membrane) for 24 hours to reach 3-4 times enrichment compared to *in-situ* DOC concentrations and then filled into the incubation bottles.

Treatment 2+3: In order to test, whether the addition of labile DOM can stimulate the microbial degradation of refractory DOM (Hypothesis 2), two treatments were established. One treatment simulated a potentially naturally occurring mixing with surface water containing freshly produced, labile DOM. Deep sea water was 20 µm filtered to remove large organisms and mixed with 0.2 µm filtered surface water from the ship's seawater pump (app. 6 m water depth) in a ratio of 4:1. In the third treatment labile compounds were added artificially from a stock solution containing 1.2 mM glucose and 0.75 mM leucine (end concentrations 500 nM and 311 nM, respectively). Final concentrations are close to observed total sugar and total amino acid concentrations in open ocean surface systems (Kirchman et al. 2001; Goldberg et al. 2011; Shen et al. 2012).

Treatment 4 (Control): Deep sea water that was filtered over a 20 µm gaze and then filled into the bottles.

After successive periods, oxygen consumption rates were determined in the incubation bottles using non-invasive optical oxygen sensors (PreSense). As heterotrophic degradation of organic molecules consumes oxygen, the rates estimated can be used to derive differences in microbial metabolic activities.

Samples for OM concentration (TOC/TN) and composition (TCHO, TAA, and C/FDOM) were taken on day 0, 2, 5, 15 and at the end of the incubation period (after 22 or 30 days) from triplicate bottles. Additionally, samples for particulate organic matter (POC/N and POP), gel particles, and total phosphorous and nutrient concentrations were taken from one replicate per treatment on each sampling day. At the initial and final experiment days, samples for bacterial DNA and confocal laser scanning microscopy were taken to trace possible changes in the structure and properties of the bacterial community.

7.3.6 Preliminary and expected results

Results of *the incubation experiments and field samplings* will be used to elucidate microbial processing of deep sea DOM.

First explorative microscopic observations of the abundance of nitrogen-rich gel particles (CSP) and carbohydrate-rich gel particles (TEP) have been conducted on board. While surface waters seemed to contain a higher number of TEP, the amount of TEP had an apparent decrease over depth. In contrast, CSP abundance seemed to be low at the surface and increasing over depth, having its maximum abundance well deeper than the observed pycnocline depths. Quantitative and qualitative analyses of gel particles will be conducted in the home laboratory at GEOMAR in Kiel.

First results of both incubation experiments indicate low oxygen consumption in the control and artificial treatments (Treatments 3+4) while no consumption was detectable in the ultrafiltration and priming treatments (Fig.7.66).

Samples for cell abundances, carbohydrate- and protein-rich gel particles, nutrients, total and particulate organic matter concentrations, as well as OM composition were preserved and

stored at +4°C and -20°C, respectively, and will be analyzed in the home laboratory at GEOMAR in Kiel.

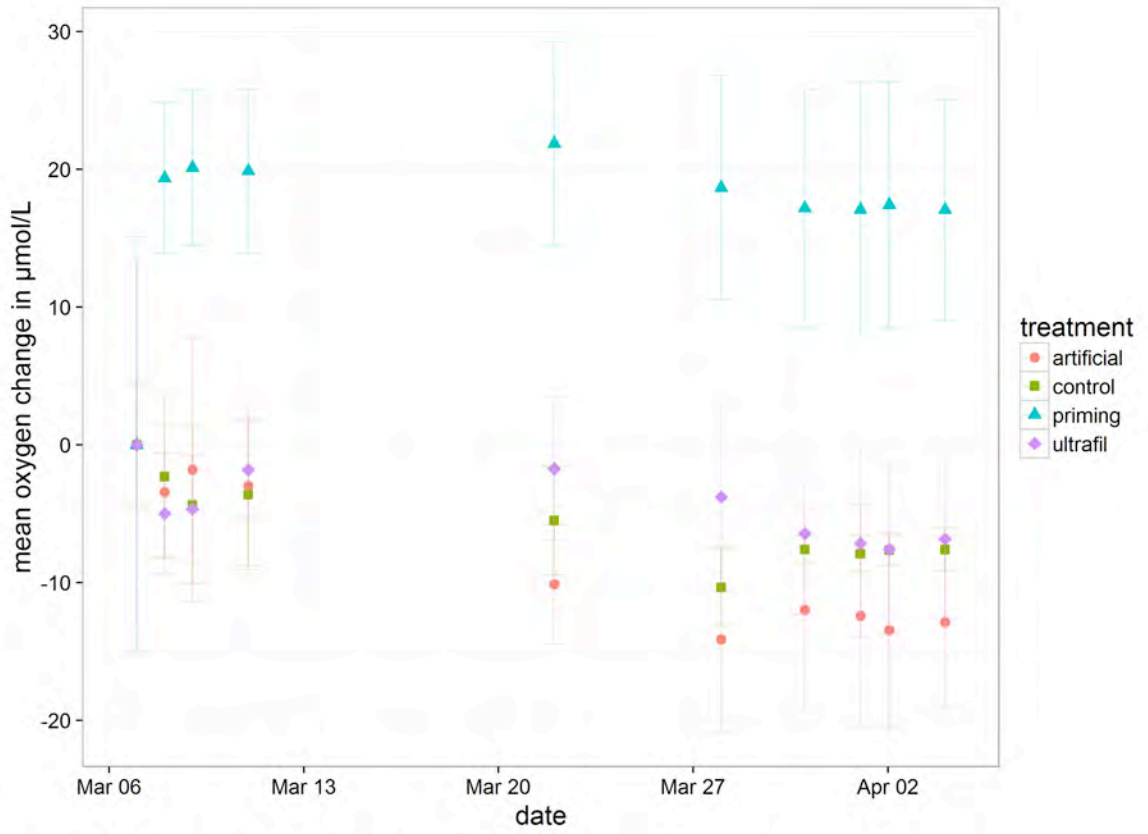

Fig. 7.66 Mean oxygen concentration change in experiment 1 grouped by treatments. Artificial: deep sea water spiked with glucose-leucine solution, control: deep sea water, priming: deep sea water mixed with 20% surface water, ultrafil: 4 x concentrated deep sea water. Error bars indicate the standard deviation from the mean (n=3).

7.3.7 Data Management

Sample analysis will be finalized within one year after the cruise. Data analysis and publication in international journals is planned within two years after the cruise. Data will be made available to the public via the GEOMAR data archive OCEANREP after publishing.

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Appendix I (SO255 Rock Sampling Summary)

Cruise	Type	Stat.	Location	total volume	Rec. DR	Rock summary	on bottom / start lat °N	long °	off bottom / end lat °N	long°	depth (m) begin	end	Mag	VC	Sed	Mn
SO255	T	1				*Station does not exist (computer problem)*										
SO255	DR	2	Seamount W of Colville Ridge	1/6 full	1	lava fragm., volcaniclastic and sedimentary rocks, Mn-crusts	-33,564	177,892	-33,558	177,896	2540	2180	1	1	1	1
SO255	DR	3	Seamount W of Colville Ridge	few rocks	1	lava fragm., volcaniclastic and sedimentary rocks, Mn-crusts	-33,560	177,925	-33,557	177,927	2148	1900	1	1	1	1
SO255	DR	4	Ridge E of Colville Ridge	full	1	lava fragments, intrusive and volcaniclastic rocks	-33,998	178,276	-34,004	178,268	1811	1298	1	1		
SO255	DR	5	Ridge E of Colville Ridge	1/4 full	1	lava fragments, solidified sediments, carbonate	-33,938	178,240	-33,944	178,246	2280	1875	1		1	
SO255	DR	6	Havre Trough, cone	one rock	0	pumice (probably not in situ)	-34,095	178,454	-34,101	178,449	2876	2440				
SO255	DR	7	Havre Trough, cone	few rocks	1	lava fragments	-34,115	178,505	-34,116	178,498	2991	2596	1			
SO255	CTD	8	Havre Trough, basin			*water sampling, 3.538m*	-34,233	178,449	-34,233	178,449						
SO255	DR	9	Havre Trough, ridge-like structure	empty	0		-34,304	178,399	-34,309	178,404	3542	3134				
SO255	DR	10	Havre Trough, ridge-like structure	empty	0		-34,281	178,441	-34,281	178,433	3317	2957				
SO255	DR	11	Havre Trough, cone	empty	0		-34,499	178,370	-34,504	178,365	2665	2273				
SO255	DR	12	Havre Trough, Gill Seamount	1/6 full	1	lava fragments	-34,649	178,380	-34,643	178,375	2482	2094	1			
SO255	NET	13	Havre Trough			*plankton sampling*	-34,537	178,509	-34,536	178,509						
SO255	DR	14	Havre Trough, cone	1/6 full	1	lava fragments	-34,536	178,509	-34,531	178,507	2779	2416	1			
SO255	DR	15	Havre Trough, ridge-like structure	full	1	lava fragments, volcaniclastic rocks incl. breccia and pumice	-34,416	178,585	-34,412	178,579	2965	2504	1	1		
SO255	DR	16	Havre Trough, ridge-like structure	empty	0		-34,252	178,691	-34,248	178,687	3380	2957				
SO255	DR	17	Havre Trough, ridge-like structure	1/5 full	1	volcaniclastic rocks (pumice), Mn-crusts	-34,293	178,655	-34,286	178,652	2875	2472		1		1
SO255	DR	18	Havre Trough, cone	few rocks	1	lava fragments	-34,477	178,759	-34,470	178,759	2363	2049	1			
SO255	DR	19	Havre Trough, cone	1/6 full	1	lava fragments	-34,417	179,033	-34,410	179,032	2015	1666	1			
SO255	DR	20	Havre Trough, cone	1/4 full	1	lava fragments	-34,508	179,097	-34,502	179,096	1926	1587	1			
SO255	DR	21	Havre Trough, Kibblewhite Complex	3/4 full	1	lava fragments	-34,467	179,233	-34,461	179,234	1795	1379	1			
SO255	DR	22	Havre Trough, Kibblewhite Complex	few rocks	1	lava fragments	-34,498	179,239	-34,491	179,238	1782	1386	1			
SO255	DR	23	Havre Trough, Kibblewhite Complex	few rocks	1	lava fragments, Mn-crusts	-34,497	179,288	-34,491	179,289	2476	2242	1			1
SO255	DR	24	Havre Trough, Kibblewhite Complex	one rock	1	lava fragment	-34,486	179,363	-34,480	179,361	3081	2732	1			
SO255	DR	25	Havre Trough, Kibblewhite Complex	1/6 full	1	lava fragments	-34,517	179,334	-34,512	179,332	2885	2535	1			
SO255	DR	26	Havre Trough, Kibblewhite Complex	3/4 full	1	lava fragments	-34,579	179,242	-34,579	179,251	1511	1150	1			
SO255	DR	27	Havre Trough, Kibblewhite Complex	1/3 full	1	volcaniclastic rocks (pumice)	-34,624	179,253	-34,625	179,261	1930	1707		1		
SO255	DR	28	Havre Trough, Kibblewhite Complex	1/2 full	1	lava fragments, volcaniclastic rocks (pumice)	-34,674	179,279	-34,675	179,286	2230	1866	1	1		
SO255	DR	29	Havre Trough, Kibblewhite Complex	1/4 full	1	lava fragments, volcaniclastic rocks (pumice)	-34,568	179,339	-34,572	179,345	2301	1948	1	1		
SO255	DR	30	Kermadec Ridge, western flank	1/4 full	1	lava fragments, volcaniclastic and sedimentary rocks	-34,547	179,481	-34,551	179,487	2235	1720	1	1	1	
SO255	DR	31	Kermadec Ridge, western flank	1/4 full	1	lava fragments	-34,487	179,482	-34,483	179,487	2670	2330	1			
SO255	DR	32	Kermadec Ridge, western flank	1/4 full	1	lava fragments, volcaniclastic rocks	-34,253	179,506	-34,257	179,512	2990	2537	1	1		
SO255	DR	33	Kermadec Ridge, western flank	empty	0		-34,322	179,531	-34,316	179,538	2400	2092				
SO255	DR	34	Kermadec Ridge, western flank	empty	0		-34,318	179,532	-34,313	179,537	2290	1968				
SO255	DR	35	Kermadec Ridge, western flank	2/3 full	1	lava fragments, volcaniclastic and sedimentary rocks	-34,345	179,608	-34,342	179,610	1739	1459	1	1	1	
SO255	DR	36	Kermadec Fore Arc	few rocks	0	semi-consolidated sediment, mud	-35,635	181,060	-35,630	181,062	6859	6564			1	
SO255	DR	37	Kermadec Fore Arc	1/3 full	1	sedimentary rocks, mud	-35,785	181,038	-35,777	181,038	6754	6438			1	

Appendix I (SO255 Rock Sampling Summary)

Cruise	Type	Stat.	Location	total volume	Rec. DR	Rock summary	on bottom / start lat °N	long °	off bottom / end lat °N	long°	depth (m) begin	end	Mag	VC	Sed	Mn
SO255	DR	38	Kermadec Fore Arc	1/5 full	1	sedimentary rocks, mud	-35,743	181,059	-35,735	181,054	7071	6708			1	
SO255	DR	39	Kermadec Fore Arc	1/3 full	1	sedimentary rocks, mud	-35,550	180,430	-35,545	180,426	4381	4077			1	
SO255	DR	40	Kermadec Fore Arc	empty	0		-34,354	181,108	-34,349	181,102	5526	4954				
SO255	NET	41	Kermadec Fore Arc			plankton sampling	-34,354	181,108	-34,349	181,102						
SO255	DR	42	Kermadec Fore Arc	empty	0		-34,265	181,129	-34,263	181,126	5668	5265				
SO255	DR	43	Kermadec Fore Arc	few rocks	1	sedimentary rocks, mud	-33,092	181,753	-33,087	181,746	5486	5035			1	
SO255	DR	44	Kermadec Fore Arc	few rocks	0	semi-consolidated sediment, mud	-32,457	182,430	-32,455	182,422	8595	8202				
SO255	DR	45	Kermadec Fore Arc	few rocks	1	intrusive, volcaniclastic, and sedimentary rocks, mud	-31,862	182,663	-31,857	182,648	8774	7787	1	1	1	
SO255	DR	46	Kermadec Fore Arc	few rocks	0	semi-consolidated sediment, mud	-31,853	182,659	-31,854	182,651	8477	7937				
SO255	DR	47	Kermadec Fore Arc	1/6 full	1	lava fragments, volcaniclastic and sedimentary rocks	-29,780	183,562	-29,787	183,557	8106	7737				
SO255	DR	48	Kermadec Fore Arc	empty	0		-29,135	183,850	-29,141	183,843	8500	8220				
SO255	DR	49	Kermadec Fore Arc	few rocks	0	semi-consolidated sediment, mud	-29,047	183,860	-29,052	183,854	8550	8120				
SO255	CTD	50	Kermadec Fore Arc			water sampling	-29,699	183,183	-29,699	183,182						
SO255	DR	51	Kermadec Fore Arc (seamount)	1/6 full	1	volcaniclastic and sedimentary rocks	-29,814	183,281	-29,820	183,280	4450	4150		1	1	
SO255	DR	52	Kermadec Ridge, western flank	few rocks	1	volcaniclastic rocks	-29,870	181,666	-29,879	181,671	1608	1100		1		
SO255	DR	53	Kermadec Ridge, western flank	few rocks	1	volcaniclastic rocks	-29,809	181,740	-29,813	181,743	1210	958		1		
SO255	DR	54	Kermadec Ridge, western flank	1/3 full	1	volcaniclastic and sedimentary rocks	-29,833	181,711	-29,836	181,717	1477	1165		1	1	
SO255	DR	55	Havre Trough, Giggenbach volcanic field	2/3 full	1	lava fragments	-29,965	181,406	-29,968	181,412	1550	1230	1			
SO255	DR	56	Havre Trough, Giggenbach volcanic field	1/2 full	1	lava fragments	-30,012	181,349	-30,016	181,356	1050	694	1			
SO255	NET	57	Havre Trough, Giggenbach volcanic field			plankton sampling, 4000m	-29,945	181,270	-29,945	181,270						
SO255	DR	58	Havre Trough, Giggenbach volcanic field	1/2 full	1	lava fragments, volcaniclastic rocks	-29,945	181,270	-29,950	181,277	874	639	1	1		
SO255	DR	59	Havre Trough, Giggenbach volcanic field	full	1	volcaniclastic rocks (pumice)	-30,017	181,279	-30,023	181,283	590	244		1		
SO255	DR	60	Havre Trough, Giggenbach volcanic field	full	1	volcaniclastic rocks (pumice)	-30,093	181,249	-30,097	181,253	783	583		1		
SO255	EM	61	Havre Trough and Colville Ridge			EM122 and Parasound profiling										
SO255	DR	62	Kermadec Ridge, crest	1/6 full	1	lava fragments, volcaniclastic rocks	-28,442	182,343	-28,447	182,348	1512	1161	1	1		
SO255	DR	63	Kermadec Ridge, western flank	1/4 full	1	lava fragments, sedimentary rocks	-28,123	182,268	-28,128	182,273	2204	1770	1		1	
SO255	DR	64	Havre Trough, major scarp	1/3 full	1	lava fragments, volcaniclastic and sedimentary rocks	-28,367	182,041	-28,372	182,042	1921	1646	1	1	1	
SO255	DR	65	Havre Trough, cone	full	1	lava fragments	-28,371	181,932	-28,377	181,934	1193	877	1			
SO255	DR	66	Havre Trough, cone	few rocks	1	volcaniclastic rocks (pumice)	-28,336	181,794	-28,340	181,796	1784	1642		1		
SO255	DR	67	Havre Trough	1/4 full	1	volcaniclastic rocks (pumice)	-28,306	181,661	-28,313	181,663	1634	1263		1		
SO255	DR	68	Havre Trough, ridge-like structure	1/4 full	1	lava fragments	-28,277	181,628	-28,283	181,631	1500	1158	1			
SO255	DR	69	Havre Trough, ridge-like structure	1/3 full	1	lava fragments, volcaniclastic and sedimentary rocks	-28,181	181,527	-28,188	181,528	1856	1435	1	1	1	
SO255	DR	70	Havre Trough, cone	1/3 full	1	volcaniclastic rocks (pumice)	-28,233	181,456	-28,241	181,460	1758	1441		1		
SO255	DR	71	Havre Trough, cone	one rock	0	volcaniclastic rock (pumice)	-28,230	181,310	-28,236	181,316	2458	2072				
SO255	DR	72	Havre Trough, cone	empty	0		-28,225	181,397	-28,231	181,399	1673	1305				
SO255	NET	73	Havre Trough			plankton sampling	-28,125	180,983	-28,133	180,995						
SO255	DR	74	Havre Trough, cone	few rocks	1	volcaniclastic rocks (pumice)	-28,136	180,996	-28,142	181,002	2066	1794		1		

Appendix I (SO255 Rock Sampling Summary)

Cruise	Type	Stat.	Location	total volume	Rec. DR	Rock summary	on bottom / start lat °N	long °	off bottom / end lat °N	long°	depth (m) begin	end	Mag	VC	Sed	Mn
SO255	DR	75	Colville (Lau) Ridge, seamount	1/3 full	1	volcaniclastic rocks	-28,091	180,532	-28,097	180,534	995	676		1		
SO255	DR	76	Colville (Lau) Ridge, seamount	1/3 full	1	lava fragments, volcaniclastic rocks	-28,024	180,234	-28,026	180,234	1018	877	1	1		
SO255	CTD	77	Colville (Lau) Ridge			water sampling, 200m	-28,502	180,405	-28,502	180,404						
SO255	DR	78	Colville (Lau) Ridge	few rocks	1	lava fragments, volcaniclastic rocks	-28,502	180,404	-28,510	180,402	1372	1002	1	1		
SO255	DR	79	Colville (Lau) Ridge, cone			aborted due to brocken winch										
SO255	NET	80	Colville (Lau) Ridge			plankton sampling	-29,100	180,279	-29,108	180,283						
SO255	EM	81	Colville (Lau) Ridge			EM122 and Parasound profiling										
SO255	DR	82	Colville (Lau) Ridge, cone	1/5 full	1	volcaniclastic rocks	-30,783	179,638	-30,789	179,637	817	585		1		
SO255	DR	83	Seamount W of Colville (Lau) Ridge	one rock	1	lava fragment (?), Mn-crust	-30,570	179,248	-30,575	179,249	2158	1849	1			1
SO255	DR	84	Seamount W of Colville (Lau) Ridge	few rocks	1	sedimentary rocks, Mn-crusts	-30,478	179,409	-30,471	179,406	1891	1547			1	1
SO255	DR	85	Colville (Lau) Ridge, seamount	few rocks	1	lava fragments, volcaniclastic rocks	-30,215	179,760	-30,207	179,760	1200	755	1	1		
SO255	DR	86	Colville (Lau) Ridge, seamount	empty	0		-30,220	179,762	-30,215	179,762	1510	1163				
SO255	DR	87	Colville (Lau) Ridge	one rock	1	sedimentary rock	-29,920	180,254	-29,914	180,250	1562	1352			1	
SO255	DR	88	Colville (Lau) Ridge, seamount	two rocks	0	volcaniclastic rocks (pumice)	-29,536	180,263	-29,534	180,257	1785	1533				
SO255	DR	89	Colville (Lau) Ridge, seamount	few rocks	1	volcaniclastic and sedimentary rocks	-29,586	180,233	-29,586	180,231	1013	844		1	1	
SO255	DR	90	Colville (Lau) Ridge	1/5 full	1	volcaniclastic and sedimentary rock, semi-consolidated mud	-29,614	180,243	-29,610	180,239	1487	1180		1	1	
SO255	DR	91	Colville (Lau) Ridge, seamount	1/3 full	1	volcaniclastic rocks (pumice)	-29,335	179,937	-29,328	179,940	1111	787		1		
SO255	DR	92	Colville (Lau) Ridge	empty	0	glass sponges	-29,300	179,881	-29,298	179,887	1120	982				
SO255	DR	93	Colville (Lau) Ridge	1/5 full	1	lava fragments, volcaniclastic rocks	-28,948	180,091	-28,945	180,095	1369	995	1	1		
SO255	DR	94	Colville (Lau) Ridge, seamount	few rocks	1	sedimentary rocks	-28,964	180,354	-28,959	180,357	1103	783			1	
SO255	DR	95	Colville (Lau) Ridge	1/4 full	1	volcaniclastic and sedimentary rocks	-28,954	180,445	-28,949	180,442	1402	968		1	1	
SO255	DR	96	Colville (Lau) Ridge, seamount	empty	0	small pieces of pumice	-28,703	180,353	-28,701	180,353	1426	1285				
SO255	DR	97	Colville (Lau) Ridge	few rocks	1	lava fragments	-28,589	180,309	-28,587	180,308	1210	1013	1			
SO255	DR	98	Colville (Lau) Ridge	1/4 full	1	lava fragments, volcaniclastic rocks	-28,571	180,326	-28,566	180,326	1034	710	1	1		
SO255	DR	99	Colville (Lau) Ridge, seamount	few rocks	1	volcaniclastic rocks	-28,533	180,396	-28,531	180,396	1217	1097		1		
SO255	NET	100	Colville (Lau) Ridge				-28,520	180,406	-28,512	180,414						
SO255	DR	101	Colville (Lau) Ridge, seamount	few rocks	1	volcaniclastic rocks	-28,550	180,351	-28,546	180,353	879	708		1		
SO255	DR	102	Havre Trough, ridge-like structure	empty	0	small pieces of pumice	-28,831	181,127	-28,826	181,128	2131	1843				
SO255	DR	103	Havre Trough, ridge-like structure	few rocks	1	lava fragments	-28,912	181,129	-28,907	181,133	2168	1825	1			
SO255	DR	104	Havre Trough, cone	1/3 full	1	lava fragments	-28,968	181,261	-28,961	181,263	1609	1291	1			
SO255	DR	105	Havre Trough, major scarp	few rocks	1	lava fragments	-28,986	181,463	-28,982	181,464	2211	1921	1			
SO255	DR	106	Havre Trough, cone	1/3 full	1	lava fragments, volcaniclastic and sedimentary rocks	-29,132	181,723	-29,126	181,725	1153	844	1	1	1	
SO255	DR	107	Havre Trough, ridge-like structure	few rocks	1	lava fragments	-29,158	181,568	-29,154	181,568	1791	1505	1			
SO255	CTD	108	Havre Trough				-29,427	181,376	-29,427	181,375						
SO255	DR	109	Havre Trough, ridge-like structure	3/4 full	1	lava fragments	-29,427	181,376	-29,420	181,377	2330	1860	1			
SO255	DR	110	Havre Trough, ridge-like structure	1/2 full	1	volcaniclastic rocks (pumice)	-29,911	181,146	-29,907	181,142	1806	1516		1		
SO255	DR	111	Havre Trough, caldera volcano	few rocks	1	lava fragments	-29,900	180,995	-29,895	180,995	1452	1180	1			

Appendix I (SO255 Rock Sampling Summary)

Cruise	Type	Stat.	Location	total volume	Rec. DR	Rock summary	on bottom / start lat °N	long °	off bottom / end lat °N	long°	depth (m) begin	end	Mag	VC	Sed	Mn
SO255	DR	112	Havre Trough, caldera volcano	1/2 full	1	lava fragments	-29,903	180,978	-29,898	180,975	1319	1040	1			
SO255	DR	113	Havre Trough, cone	few rocks	1	lava fragments, volcaniclastic rocks (pumice)	-29,861	180,895	-29,855	180,892	1567	1227	1	1		
SO255	DR	114	Havre Trough, ridge-like structure	1/5 full	1	volcaniclastic rocks (pumice)	-29,863	180,717	-29,858	180,715	2410	2110		1		
SO255	DR	115	Havre Trough, caldera volcano	1/2 full	1	lava fragments, volcaniclastic rocks (pumice)	-29,930	180,958	-29,923	180,959	1618	1260	1	1		
SO255	DR	116	Havre Trough, caldera volcano	1/5 full	1	lava fragments	-29,929	181,021	-29,923	181,019	1516	1103	1			
SO255	DR	117	Havre Trough, Giggenbach volcanic field	3/4 full	1	lava fragments, volcaniclastic rocks (pumice)	-30,097	181,171	-30,091	181,169	1432	1069	1	1		
SO255	DR	118	Havre Trough,cone	1/5 full	1	lava fragments	-30,402	180,642	-30,395	180,641	1715	1373	1			
SO255	DR	119	Havre Trough, cone	few rocks	1	lava fragments, volcaniclastic rocks (pumice)	-30,332	180,550	-30,327	180,550	2168	1833	1	1		
SO255	DR	120	Havre Trough	few rocks	1	lava fragments	-30,682	180,559	-30,676	180,560	2085	1777	1			
SO255	DR	121	Havre Trough, ridge-like structure	few rocks	1	lava fragments	-30,699	180,610	-30,699	180,618	1734	1353	1			
SO255	DR	122	Havre Trough, ridge-like structure	1/5 full	1	lava fragments	-30,786	180,689	-30,786	180,696	1967	1810	1			
SO255	DR	123	Havre Trough, cone	1/4 full	1	lava fragments	-30,897	180,846	-30,896	180,854	1669	1374	1			
SO255	DR	124	Kermadec volcanic front	full	1	lava fragments, volcaniclastic rocks (incl. pumice)	-31,054	181,094	-31,048	181,095	1133	777	1	1		
SO255	DR	125	Kermadec Ridge, west. flank (volc. front?)	1/3 full	1	lava fragments, volcaniclastic and sedimentary rocks (carb.)	-31,026	181,260	-31,020	181,261	883	504	1	1	1	
SO255	DR	126	Kermadec Ridge, western flank	full	1	lava fragments, volcaniclastic rocks (incl. pumice)	-31,613	181,135	-31,614	181,141	1217	872	1	1		
SO255	DR	127	Kermadec Ridge, western flank	full	1	volcaniclastic and sedimentary rocks	-31,699	181,074	-31,700	181,077	1300	910		1	1	
SO255	DR	128	Kermadec Ridge, western flank	few rocks	1	lava fragments	-31,782	180,965	-31,784	180,971	2314	1933	1			
SO255	DR	129	Kermadec Ridge, western flank	full	1	lava fragments	-31,804	180,961	-31,805	180,967	1716	1325	1			
SO255	DR	130	Kermadec Ridge, western flank	1/5 full	1	lava fragments	-31,683	180,985	-31,685	180,991	2395	2091	1			
SO255	DR	131	Kermadec Ridge, western flank	1/4 full	1	lava fragments, sedimentary rocks	-31,864	180,939	-31,864	180,944	2040	1730	1		1	
SO255	DR	132	Kermadec Ridge, western flank	1/3 full	1	lava fragments, semi-consolidated sediment	-31,979	180,893	-31,977	180,898	1010	1635	1			
SO255	DR	133	Kermadec volcanic front	1/3 full	1	lava fragments	-32,087	180,731	-32,087	180,740	2230	1830	1			
SO255	DR	134	Kermadec Ridge, western flank	full	1	lava fragments, volcaniclastic rocks	-32,297	180,710	-32,297	180,717	2945	2753	1	1		
SO255	DR	135	Kermadec Ridge, western flank	1/4 full	1	lava fragments, volcaniclastic rocks	-32,325	180,715	-32,322	180,722	2275	1961	1	1		
SO255	DR	136	Kermadec Ridge, western flank	1/3 full	1	lava fragments, volcaniclastic rocks	-32,360	180,783	-32,358	180,790	1180	972	1	1		
SO255	DR	137	Kermadec Ridge, western flank	few rocks	1	lava fragments, volcaniclastic rocks	-32,783	180,491	-32,783	180,497	2481	2052	1	1		
SO255	DR	138	Kermadec Ridge, western flank	1/5 full	1	lava fragments, volcaniclastic rocks	-32,828	180,488	-32,826	180,495	1888	1473	1	1		
SO255	DR	139	Kermadec Ridge, western flank	3/4 full	1	lava fragments, volcaniclastic rocks	-32,929	180,472	-32,926	180,480	995	633	1	1		
SO255	DR	140	Havre Trough, ridge-like structure	empty	0		-32,882	180,363	-32,876	180,360	3076	2238				
SO255	DR	141	Kermadec volcanic front, Haungaroa volc.	1/2 full	1	lava fragments	-32,632	180,419	-32,628	180,415	1799	1544	1			
SO255	DR	142	Kermadec volcanic front, Haungaroa volc.	1/5 full	1	lava fragments	-32,626	180,378	-32,620	180,376	1024	758	1			
SO255	NET	143	Havre Trough				-32,868	180,220	-32,884	180,206						
SO255	DR	144	Havre Trough, deep basin	few rocks	0	semi-consolidated sediment, mud	-32,901	180,192	-32,896	180,192	3351	3079				
SO255	DR	145	Havre Trough, ridge-like structure	one rock	1	lava fragment	-32,875	180,140	-32,869	180,140	2905	1392	1			
SO255	DR	146	Havre Trough, deep basin	empty	0		-32,818	179,986	-32,814	179,986	4121	4026				
SO255	DR	147	Havre Trough, deep basin	few rocks	1	lava fragments, sedimentary rocks	-32,810	179,917	-32,802	179,914	3963	3591	1		1	
SO255	DR	148	Havre Trough, ridge-like structure	few rocks	1	lava frag., volcaniclastic (pumice) and sedimentary rocks	-32,681	180,032	-32,675	180,031	3115	2804	1	1	1	

Appendix I (SO255 Rock Sampling Summary)

Cruise	Type	Stat.	Location	total volume	Rec. DR	Rock summary	on bottom / start lat °N	on bottom / start long °	off bottom / end lat °N	off bottom / end long°	depth (m) begin	depth (m) end	Mag	VC	Sed	Mn
SO255	DR	149	Havre Trough, seamount	two rocks	1	lava fragments	-32,584	179,961	-32,589	179,960	3614	3256	1			
SO255	DR	150	Havre Trough, ridge-like structure	few rocks	1	volcaniclastic rocks (pumice)	-32,508	179,670	-32,503	179,669	3910	3650		1		
SO255	DR	151	Havre Trough, ridge-like structure	few rocks	1	lava fragments, volcaniclastic rocks	-32,442	179,706	-32,435	179,704	3489	2850	1	1		
SO255	DR	152	Havre Trough, ridge-like structure	one rock	1	lava fragment	-32,190	179,777	-32,184	179,776	3112	2638	1			
SO255	DR	153	Havre Trough, ridge-like structure	few rocks	1	volcaniclastic rocks (pumice)	-32,164	179,629	-32,160	179,631	3160	2884		1		
SO255	DR	154	Havre Trough, ridge-like structure	two rocks	1	lava fragments	-31,954	179,536	-31,949	179,536	2708	2384	1			
SO255	DR	155	Colville Ridge	few rocks	1	lava fragments, Mn-crusts	-31,882	179,372	-31,878	179,370	2540	2120	1			1
SO255	DR	156	Colville Ridge	one rock	1	volcaniclastic rock (large bloc with lava fragments)	-31,887	179,352	-31,885	179,351	2060	1860		1		
SO255	DR	157	Colville Ridge	few rocks	1	volcaniclastic rocks (breccia)	-31,880	179,342	-31,880	179,341	1360	1350		1		
SO255	DR	158	Colville Ridge	few rocks	1	lava fragments, volcaniclastic rocks	-31,913	179,331	-31,906	179,329	3390	2980	1	1		
SO255	DR	159	Colville Ridge	few rocks	1	lava frag., volcaniclastic rocks, semi-consolidated sediment	-31,962	179,257	-31,957	179,256	3439	3101	1	1		
SO255	DR	160	Havre Trough, ridge-like structure	few rocks	1	lava fragments	-32,412	179,613	-31,408	179,612	3461	3068	1			
SO255	DR	161	Havre Trough, ridge-like structure	few rocks	1	lava fragments, volcaniclastic rocks	-32,821	179,670	-32,816	179,668	2610	2164	1	1		
SO255	DR	162	Havre Trough, deep basin	1/2 full	1	lava fragments, volcaniclastic rocks	-32,864	179,871	-32,857	179,868	4002	3469	1			
SO255	DR	163	Havre Trough, seamount	empty	0		-32,981	179,796	-32,976	179,794	3390	2897				
SO255	DR	164	Havre Trough, cone	full	1	lava fragments, volcaniclastic rocks	-33,120	179,686	-33,126	179,686	1907	1561	1	1		
SO255	DR	165	Kermadec volcanic front, Kuiwai volcano	1/5 full	1	lava fragments	-33,158	179,989	-33,163	179,987	1407	1162	1			
SO255	DR	166	Kermadec volcanic front, Kuiwai volcano	full	1	lava fragments	-33,130	180,045	-33,134	180,043	1736	1457	1			
SO255	DR	167	Kermadec volcanic front, Kuiwai volcano	3/4 full	1	lava fragments, volcaniclastic and sedimentary rocks	-33,154	180,044	-33,159	180,043	793	555	1	1	1	
SO255	DR	168	Havre Trough, cone	one rock	1	lava fragment, Mn-crust	-33,281	180,172	-33,282	180,171	2039	1953	1			1
SO255	DR	169	Kermadec volcanic front	1/3 full	1	lava fragments	-33,344	179,841	-33,349	179,836	2200	1791	1			
SO255	DR	170	Kermadec volcanic front	full	1	lava fragments, Mn-crusts	-33,402	179,863	-33,408	179,869	1480	1094	1			1
SO255	DR	171	Kermadec volc. front, Ngatoroirangi volc.	few rocks	1	lava fragments	-33,651	179,792	-33,655	179,798	2318	2168	1			
SO255	DR	172	Kermadec volc. front, Ngatoroirangi volc.	few rocks	1	lava fragments	-33,684	179,867	-33,688	179,867	2026	1903	1			
SO255	DR	173	Kermadec volc. front, Ngatoroirangi volc.	few rocks	1	lava fragments	-33,734	179,712	-33,738	179,714	2431	2311	1			
SO255	DR	174	Havre Trough, deep basin	two rocks	1	lava fragments	-33,839	179,558	-33,844	179,561	3630	3322	1			
SO255	DR	175	Havre Trough, deep basin	empty	0		-33,809	179,510	-33,813	179,513	3814	3744				
SO255	DR	176	Kermadec volc. front, Ngatoroirangi volc.	1/5 full	1	lava fragments	-33,868	179,816	-33,875	179,819	2147	1896	1			
SO255	DR	177	Kermadec Ridge, western flank	empty	0		-34,019	179,805	-34,032	179,806	1802	1591				
SO255	DR	178	Kermadec Ridge, western flank	1/4 full	1	lava fragments, volcaniclastic and sedimentary rocks	-34,167	179,763	-34,171	179,767	1200	838	1	1	1	
SO255	DR	179	Kermadec Ridge, western flank	full	1	lava fragments, volcaniclastic rocks	-34,222	179,707	-34,226	179,710	1106	738	1	1		
SO255	DR	180	Kermadec volcanic front, Sonne volcano	empty	0		-34,080	179,467	-34,084	179,473	2683	2439				
					137	**dredges yielded magmatic and / or sed. rocks (83%)**							**102**	**69**	**30**	**9**

Dredge Stations (DR): 165
CTD / Rosette Water Sampler Stations (CTD): 4
Plankton Net Stations (NET): 7
Major EM122 and PARASOUND Surveys: 2

28 **dredges returned empty or yielded only soft sediment and / or Mn (17%)**

average depth (m): 2461
max. depth (m): 8774
min. depth (m): 590

Mag: magmatic rocks
VC: volcaniclastic rocks
Sed: sedimentary rocks
Mn: Mn-crusts, - nodules

Appendix 2 (Station Details and Rock Description)

SO255-DR2

Description of Location and Structure: Seamount West of Colville Ridge, central southern slope

Dredge on bottom UTC 04/03/17 23:22hrs, lat 34 05.71'S, long 178 27.24'E, depth 2876m

Dredge off bottom UTC 05/03/17 00:37hrs, lat 33 33.48'S, long 177 53.78'E, depth 2180m

total volume: single large block and small rock fragments

Comments: Dredgehaul recovered a large block of sediment and volcaniclstics that contain altered lava fragments. The haul samples the units above the volcanic basement. Sediment can be used to obtain biostratigraphic age.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR2-1	1. Rock Type: volcaniclastic with individual volcanic fragments 2. Size: 24x17x4cm 3. Shape / Angularity: subrounded volcanic fragments with brown veins 4. Color of cut surface: greenish gray fragments with brown veins 5. Texture / Vesicularity: dense lava infiltrated with Mn-oxides 6. Phenocrysts: Plg bearing; 1-2%; ≤1mm; patly preservd 7. Matrix: fine graiend, no visible minerals 8. Secondary Minerals: infiltrated with Mn-oxide 9. Encrustation: 1-7cm M-crust 10. Comment: highly altered volcaniclastic rock, no glass, Fsp/Plg needs checking for min sep, Ar-Ar dating	x packed with sample?	3x						
SO255-DR2-2	1. Rock Type: sedimentary rock 2. Size: 60x46x24cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige 5. Texture / Vesicularity: unlayered, some Mn-infill; sand-siltstone, foram-bearing 7. Matrix: fine to medium grained 9. Encrustations: ≤1mm 10. Comment: sedimentary rock ---> biostratigraphic ages							GNS	
SO255-DR2-3	1. Rock Type: altered dacite 2. Size: 10x9x5cm 3. Shape / Angularity: rounded 4. Color of cut surface: blueish gray to gray 5. Texture / Vesicularity: Fsp bearing, somewhat vesicular, vesicles ≤1mm ø, filled with Mn oxide 6. Phenocrysts: Fsp ≤ 1mm; few Qtz crystals ≤2mm, magnetite? relatively fresh 7. Matrix: fine grained 8. Secondary Minerals: Mn-oxide vesicle filling, brown crosscutting veins 9. Encrustations: ≤1cm Mn crust 10. Comment: Fsp and Qtz are relativley fresh --> Ar-Ar? Matrix looks usable, but need careful picking	x packed with sample?	x		good Fsp				
SO255-DR2-4	1. Rock Type: altered brown lava - andesite? 2. Size: 8x10x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish 5. Texture / Vesicularity: slight flow texture; vesicular to 20%, 1-5mm ø 6. Phenocrysts: Fsp 1-2%; 1mm; probably altered dull looking 7. Matrix: fine grained 8. Secondary Minerals: zeolite vesicle infill 1% 9. Encrustations: c. 3cm Mn crust 10. Comment: potentially usable for geochemistry using immoble elements (HFSE); Fsp probably undatable	x packed with sample?	x	?					

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR2-5	1. Rock Type: 3cm thick Mn crust 2. Size: 22x12x7cm 3. Shape / Angularity: rounded 4. Color of cut surface: black with some brow intercalated sediment 5. Texture / Vesicularity: layered Mn-crust; 1cm brown sediment between 2 layers of Mn crust 7. Matrix: Mn-oxide 9. Encrustations: 3cm Mn crust								

SO255-DR3

Description of Location and Structure: Seamount West of Colville Ridge, upper southern slope

Dredge on bottom UTC 05/03/17 02:54hrs, lat 33 33.61'S, long 177 55.49'E, depth 2148m

Dredge off bottom UTC 05/03/17 04:18hrs, lat 33 33.41'S, long 177 53.59'E, depth 1900m

total volume: few rocks

Comments: Dredgehaul recovered volcaniclastica and few small fragments of altered lava/scoria. Lava samples could be used for geochemical analyses but would require careful preparation

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR3-1	1. Rock Type: volcaniclastic, altered 2. Size: 30x20x8cm 3. Shape / Angularity: angular 4. Color of cut surface: brownish-orange 5. Texture / Vesicularity: ≤5% vesicles, sub-mm, texture clasts: scoria 7. Matrix: cemented 8. Secondary Minerals: vesicular fillings 9. Encrustations: thin Mn coating	x packed with sample?	3x						
SO255-DR3-2	1. Rock Type: volcanic, altered 2. Size: 16x7x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish-grey 5. Texture / Vesicularity: aphyric, vesicles 30%, mm - cm, texture clasts: scoria 7. Matrix: dense 8. Secondary Minerals: vesicular fillings 9. Encrustations: thick Mn crust was removed							GNS	
SO255-DR3-3A-B-C	1. Rock Type: volcanic, altered 2. Size: A:5x4x2cm, B:5x4x2cm, 5x3x1cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish 5. Texture / Vesicularity: aphyric, vesicles 20-30%, mm - cm 7. Matrix: dense 8. Secondary Minerals: vesicule fillings 9. Encrustations: Mn crust removed 10. Comment: similar to sample -2, -C not shown								 

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR3-3D	1. Rock Type: Mn-crust, part of -3A to -C 2. Size: 5x3x2cm: 8. Secondary Minerals: 9. Encrustations: Mn crust up to 1-2 cm								
SO255-DR3-4	1. Rock Type: sediment 2. Size: 10x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish 9. Encrustations: Mn-coating							GNS	

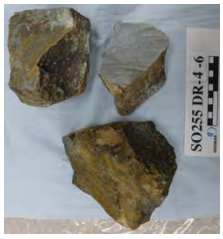
SO255-DR4

Description of Location and Structure: Large NNE-SSW striking ridge E of Colville Ridge. NE facing slope, mid section

Dredge on bottom UTC 05/03/17 08:40hrs, lat 33 59.88'S, long 178 16.54'E, depth 1811m
Dredge off bottom UTC 05/03/17 10:22hrs, lat 34 0.23'S, long 178 16.07'E, depth 1299m
total volume: full
Comments: A83

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR4-1	1. Rock Type: volcanic, no alteration 2. Size: 26x20x16cm 3. Shape / Angularity: angular 4. Color of cut surface: gray 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Px, Ore, mm sized Fsp 7. Matrix: fine grained 10. Comment: fresh rock	x_air freight box	x					GNS	
SO255-DR4-2	1. Rock Type: volcanic, no alteration 2. Size: 35x18x13cm 3. Shape / Angularity: angular 4. Color of cut surface: light gray 5. Texture / Vesicularity: aphyric, vesicles (<5%) 6. Phenocrysts: Px, Ore, mm sized Fsp 7. Matrix: fine grained 8. Secondary Minerals: in vesicles 10. Comment: fresh rock	x_air freight box	x					GNS	
SO255-DR4-3	1. Rock Type: volcanic, no alteration 2. Size: 17x13x9cm 3. Shape / Angularity: angular 4. Color of cut surface: gray 5. Texture / Vesicularity: aphyric 6. Phenocrysts: few microphenocrysts (<5%) 7. Matrix: fine grained 8. Secondary Minerals: in fractures	x_air freight box	x						

Appendix 2 (Station Details and Rock Description)

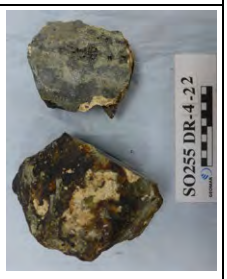
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR4-4	1. Rock Type: volcanic, slightly altered 2. Size: 20x15x7cm 3. Shape / Angularity: angular 4. Color of cut surface: gray 5. Texture / Vesicularity: aphyric, no vesicles, dense 7. Matrix: fine grained	x_air freight box	x					GNS	
SO255-DR4-5	1. Rock Type: volcanic, slightly altered --> greenshist facies? 2. Size: 33x24x21cm 3. Shape / Angularity: angular 4. Color of cut surface: greenish-gray 5. Texture / Vesicularity: porphyric, no vesicles 6. Phenocrysts: mm-sized, 30%, Fsp, Px, Amph? 7. Matrix: fine grained 8. Secondary Minerals: opaque minerals, altered Ol 10. Comment: xenolith?!, fresh phenocrysts, secondary Chl	x_air freight box	x					GNS	
SO255-DR4-6	1. Rock Type: volcanic 2. Size: 21x18x17cm 3. Shape / Angularity: angular 4. Color of cut surface: light-gray 5. Texture / Vesicularity: porphyric 6. Phenocrysts: felsic, mafic phenocrysts (30-40%, mm), Fsp, Amph? 7. Matrix: fine grained 8. Secondary Minerals: secondary minerals, sulfides, altered Ol - iddingsite	x_air freight box	x					GNS	
SO255-DR4-7	1. Rock Type: volcanic, no alteration 2. Size: 16x15x30cm 3. Shape / Angularity: angular 4. Color of cut surface: gray 5. Texture / Vesicularity: porphyric 6. Phenocrysts: magnetite (10-15%), Qtz, Fsp 7. Matrix: fine grained	x_air freight box	x					GNS	
SO255-DR4-8	1. Rock Type: volcanic, slightly altered basalt 2. Size: 18x13x9cm 3. Shape / Angularity: angular 4. Color of cut surface: bluish gray 5. Texture / Vesicularity: porphyric, no vesicles 6. Phenocrysts: Ol (30-40%, <4mm) some altered; Px (20-30%, <1mm); Pyrite < 1mm, <5%Qtz, Fsp 7. Matrix: fine grained 8. Secondary Minerals: inside and close to veins, vein Qtz	x_air freight box	x					GNS	
SO255-DR4-9	1. Rock Type: volcanic, basalt 2. Size: 19x15x14cm 3. Shape / Angularity: angular 4. Color of cut surface: medium gray 5. Texture / Vesicularity: porphyric, weakly altered 6. Phenocrysts: Ol (5%); CPx (2%) 7. Matrix: very fine grained 8. Secondary Minerals: Plg altered	x_air freight box	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR4-10	1. Rock Type: volcanic, slightly altered basalt 2. Size: 11x9x6cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: bluish gray to gray 5. Texture / Vesicularity: porphyric, vesicles some small 6. Phenocrysts: altered Ol, Px (15-20mm; 2mm) 7. Matrix: fine grained	x_air freight box	x						
SO255-DR4-11	1. Rock Type: volcanic, basalt 2. Size: 40x35x30cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark gray - black 5. Texture / Vesicularity: porphyric, strongly hydrothermally altered 6. Phenocrysts: Fsp <2%, Px <2% 7. Matrix: fine grained 8. Secondary Minerals: altered Ol	x_air freight box	x					GNS	
SO255-DR4-12	1. Rock Type: intrusive, microgabbro, microdolerite 2. Size: 35x26x23cm 3. Shape / Angularity: subangular 4. Color of cut surface: bluish gray 5. Texture / Vesicularity: equigranular 6. Phenocrysts: altered Ol, Px, Fsp 7. Matrix: fine grained 8. Secondary Minerals: 2mm Mn crust 10. Comment: may be U-Pb dating of Zircons	x_air freight box	x					U-Pb zircons	
SO255-DR4-13	1. Rock Type: intrusive, microgabbro - dolerite 2. Size: 19x18x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: alternating dots of light gray / dark gray 5. Texture / Vesicularity: equigranular 6. Phenocrysts: 15% Fsp, 10-15% Px 7. Matrix: coarse grained 8. Secondary Minerals: epidote alteration along fractures 10. Comment: pore space from exsolution	x_air freight box	x					GNS; U-Pb zircons	
SO255-DR4-14	1. Rock Type: siliceous volcanic 2. Size: 10x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: gray / white gray 5. Texture / Vesicularity: fine grained to aphyric, vesicles 6. Phenocrysts: veins white (Qtz) and dark (glassy) 7. Matrix: fine grained 8. Secondary Minerals: epidote alteration along fractures 9. Encrustations: <1mm Mn crust	x							
SO255-DR4-15	1. Rock Type: siliceous volcanic 2. Size: 16x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: medium gray 5. Texture / Vesicularity: aphanitic, fine grained 6. Phenocrysts: veins possibly Qtz 7. Matrix: fine grained	x						GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR4-16	1. Rock Type: volcanic 2. Size: 17x9x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: white gray to bluish gray 5. Texture / Vesicularity: porphyric, no vesicles 6. Phenocrysts: Fsp altered 7. Matrix: fine grained 8. Secondary Minerals: Ilmenite 9. Encrustations: <1mm Mn crust 10. Comment: similar to 17	x						GNS	
SO255-DR4-17	1. Rock Type: volcanic 2. Size: 12x7x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light gray, felsic 5. Texture / Vesicularity: porphyritic 6. Phenocrysts: Fsp 7. Matrix: fine grained 8. Secondary Minerals: Hematite 9. Encrustations: <1mm Mn crust 10. Comment: possible glassy parts	x						GNS	
SO255-DR4-18	1. Rock Type: slightly altered intrusive 2. Size: 13x12x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: bluish gray 5. Texture / Vesicularity: equigranular, no vesicles 6. Phenocrysts: altered Ol, Px (20%), Fsp 7. Matrix: fine grained 8. Secondary Minerals: veins filled with Cc or sulfide 9. Encrustations: <1mm Mn crust 10. Comment: similar to -12	x						GNS	
SO255-DR4-19	1. Rock Type: volcanic, basalt 2. Size: 38x25x25cm 3. Shape / Angularity: angular 4. Color of cut surface: bluish gray, dark gray spots 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px 1, Ol <0%), Fsp 7. Matrix: fine grained 8. Secondary Minerals: secondary Qtz 9. Encrustations: <1mm Mn crust	x						GNS	
SO255-DR4-20	1. Rock Type: volcaniclastic, basalt 2. Size: 20x12x25cm 3. Shape / Angularity: angular 4. Color of cut surface: dark gray to bluish gray spots 5. Texture / Vesicularity: dense, no vesicles 6. Phenocrysts: Fsp 7. Matrix: fine grained 8. Secondary Minerals: epidote in veins 9. Encrustations: <1mm Mn crust	x							
SO255-DR4-21	1. Rock Type: volcaniclastic, breCcia 2. Size: 17x14x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: very dark grayish brown, black blobs 5. Texture / Vesicularity: very poorly sorted pebbles 6. Phenocrysts: monomectic, jigsaw fit, very angular clasts (30%) 7. Matrix: fine grained 60% cement, 10% matrix 9. Encrustations: <1mm 10. Comment: lagest clast 3x2 cm	x						GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR4-22	1. Rock Type: siliceous volcanic, altered 2. Size: 16x13x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark gray to greenish, bluish gray 5. Texture / Vesicularity: porphyritic 6. Phenocrysts: Fsp 20%, <1mm, altered 7. Matrix: altered fine grained 60% 9. Encrustations: <1mm Mn crust	x						GNS	
SO255-DR4-23	1. Rock Type: breccia volcaniclastic 2. Size: 22x14x9cm 3. Shape / Angularity: angular 4. Color of cut surface: marix beige / white hemipelagic mud, suspended organics, clasts are gray 5. Texture / Vesicularity: poorly sorted; large cobble							GNS	
SO255-DR4-24	1. Rock Type: volcanic, highly altered 2. Size: 20x12x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: light gray 5. Texture / Vesicularity: porphyric, no vesicles 6. Phenocrysts: Qtz, Fsp 7. Matrix: fine grained							GNS	
SO255-DR4-25	1. Rock Type: altered volcanic 2. Size: 14x14x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark gray 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px 7. Matrix: fine grained 8. Secondary Minerals: Epidote veins							GNS	
SO255-DR4-26	1. Rock Type: volcanic altered 2. Size: 20x13x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: bluish gray 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Fsp, Px 7. Matrix: fine grained 8. Secondary Minerals: Epidote veins 9. Encrustations: <1mm Mn crust							GNS	
SO255-DR4-27	1. Rock Type: volcanic altered 2. Size: 13x13x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark gray to medium gray 5. Texture / Vesicularity: no vesicles 6. Phenocrysts: Pyrite? red altered stuff (pyrite or Ol?) 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: large metallic slab that must be wrapped for transport. Highly magnetic, delicate							GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR4-28	1. Rock Type: altered volcanic 2. Size: 8x6x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: light gray to reddish 5. Texture / Vesicularity: no vesicles, porphyric 7. Matrix: fine grained 8. Secondary Minerals: white veins (Qtz?)							GNS	
SO255-DR4-29	1. Rock Type: altered volcaniclastic 2. Size: 10x12x17cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: bluish gray to reddish 5. Texture / Vesicularity: no vesicles 6. Phenocrysts: poorly sorted. small pebbles 7. Matrix: fine grained 8. Secondary Minerals: white veins (Qtz?) 9. Encrustations: perlitic texture, flow banding 10. Comment: rounded features, altered light and dark rims							GNS	
SO255-DR4-30	1. Rock Type: volcanic altered 2. Size: 17x10x7cm 3. Shape / Angularity: subangular to rounded 4. Color of cut surface: bluish gray 5. Texture / Vesicularity: no vesicles 6. Phenocrysts: Fsp, Px, some altered 7. Matrix: fine grained							GNS	
SO255-DR4-31	1. Rock Type: volcanic altered 2. Size: 11x10x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: bluish gray 5. Texture / Vesicularity: no vesicles 6. Phenocrysts: Pyrite, some altered minerals 8. Secondary Minerals: white veins							GNS	
SO255-DR4-32	1. Rock Type: altered volcanic 2. Size: 12x10x7cm 3. Shape / Angularity: rounded 4. Color of cut surface: medium gray to bluish gray 5. Texture / Vesicularity: no vesicles 6. Phenocrysts: red / orange altered minerals 7. Matrix: fine graines 8. Secondary Minerals: white veins (Qtz?)							GNS	
SO255-DR4-33	1. Rock Type: volcaniclastic altered, two pieces taken 2. Size: 26x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark gray to brownish 5. Texture / Vesicularity: poorly sorted, medium pebble 6. Phenocrysts: clasts <15mm 7. Matrix: altered, fine grained (~10% matrix)							GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR4-34	1. Rock Type: volcaniclastic altered, two pieces taken 2. Size: 23x13x9cm; 26x12x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: light gray to bluish gray 5. Texture / Vesicularity: poorly sorted, medium pebble 6. Phenocrysts: clasts <15mm 8. Secondary Minerals: altered rims							GNS	
SO255-DR4-35	1. Rock Type: volcanic altered, three pieces taken 2. Size: 13x13x6cm; 26x12x12cm; 13x9xx6cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish gray 5. Texture / Vesicularity: no vesicles, porphyric in some areas flow structures 6. Phenocrysts: dark green altered 8. Secondary Minerals: filled veins with altered, red material							GNS	
SO255-DR4-36	1. Rock Type: volcanic altered, three pieces taken 2. Size: 10x13x7cm; 18x18x11cm; 13x9x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish, brownish, light gray 5. Texture / Vesicularity:poorly sorted 8. Secondary Minerals: veins filled with Epidote, altered veins							GNS	
SO255-DR4-37	1. Rock Type: volcanic, altered basalt 2. Size: 22x10x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark gray 5. Texture / Vesicularity: porphyric, no vesicles 6. Phenocrysts: Ol (15-20%, Px, Fsp 7. Matrix: fine grained, mafic 8. Secondary Minerals: veins with secondary minerals							GNS	
SO255-DR4-38	1. Rock Type: volcanic, altered basalt 2. Size: 14x10x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light gray 5. Texture / Vesicularity: black minerals 7. Matrix: fine grained, mafic 8. Secondary Minerals: veins filled with secondary minerals, Pyrite							GNS	
SO255-DR4-39	1. Rock Type: volcanic altered basalt 2. Size: 14x10x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light gray 5. Texture / Vesicularity: no vesicles, porphyric 6. Phenocrysts: Px, Ol?, Fsp 8. Secondary Minerals: Pyrite in and close to veins; epidote veins? 10. Comment: altered rim							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR4-40	1. Rock Type: volcanic altered 2. Size: 10x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: bluish gray 5. Texture / Vesicularity: porphyric, no vesicles 6. Phenocrysts: Ol?, Px, Fsp 7. Matrix: fine grained 8. Secondary Minerals: Pyrite							GNS	
SO255-DR4-41	1. Rock Type: volcanic hydrothermally altered 4 pieces taken 2. Size: 14x16x12cm; 14x8x3cm; 14x10x5cm; 13x9x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish, reddish green 5. Texture / Vesicularity: porphyric, no vesicles 7. Matrix: poorly sorted 8. Secondary Minerals: veins with white material 9. Encrustations: <10 cm Mn crust (?)							GNS	
SO255-DR4-42	1. Rock Type: altered volcanic 2. Size: 17x15x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: bluish gray 5. Texture / Vesicularity: porphyric, no vesicles 6. Phenocrysts: Ol?, Px, Fsp 7. Matrix: fine grained 8. Secondary Minerals: Pyrite							GNS	

SO255-DR5

Description of Location and Structure: Colville Ridge, offset ridge E of Coleville. NW facing slope at N tip along lower most section

Dredge on bottom UTC 05/03/17 12:34hrs, lat 33 56.30'S, long 178 14.38'E, depth 2280m

Dredge off bottom UTC 05/03/17 13:54hrs, lat 33 56.62'S, long 178 14.74'E, depth 1875m

total volume: 1/4 full

Comments: Dredge potentially recovered the lower units of a ridge structure E of Colville Ridge. The structure is likely a rifted piece of the Colville Ridge. Lavas are medium to strongly altered andesites with variable amounts of Fsp and less volumes of mafic minerals (Px/Amph?). Minerals to be checked for potential dating.

	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR5-1	1. Rock Type: volcanic, altered, andesite 2. Size: 22x11x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown-grey 5. Texture / Vesicularity: porphyric, slightly porous, groundmass weakly vesicular 6. Phenocrysts: Fsp (20-30%, Px/Amph? 7. Matrix: altered, brownish groundmass 8. Secondary Minerals: brown alteration 9. Encrustations: clastic, sedimentary crust	x_air freight box	x					GNS	
SO255-DR5-2A	1. Rock Type: volcanic, with alteration veins, intermediate rock 2. Size: 24x5x22cm 3. Shape / Angularity: subangular 4. Color of cut surface: light-grey 5. Texture / Vesicularity: porphyritic 6. Phenocrysts: Fsp (30-40%) 7. Matrix: fine grained 8. Secondary Minerals: alteration vein, very fine grained, alteration rim, altered brownish minerals (sulfides?)	x_air freight box	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR5-2B	1. Rock Type: volcanic clast 2. Size: 37x8x22cm 3. Shape / Angularity: subangular, rounded clast 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, vesicular, porous 6. Phenocrysts: Fsp (30%), brownish altered rocks 7. Matrix: fine grained, porous 10. Comment: volcanic clast in breccia	x_air freight box	x						
SO255-DR5-3	1. Rock Type: volcanic 2. Size: 9x9x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, vesicles CC filled 6. Phenocrysts: Fsp, CC veins / vesiscles 7. Matrix: fine grained 8. Secondary Minerals: carbonate 10. Comment: Mn fillings along veins and vesicles	x	x						
SO255-DR5-4	1. Rock Type: volcanic, altered 2. Size: 8x6x6cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, vesicles CC filled 6. Phenocrysts: altered Ol?, Fsp 7. Matrix: fine grained 8. Secondary Minerals: pinkish-greenish carbonate, Mn fillings along veins 10. Comment: similar to -3	x	x						
SO255-DR5-5	1. Rock Type: volcanic, slightly altered 2. Size: 14x18x25cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, no vesicles 6. Phenocrysts: Fsp small, Px bigger, mm scale 7. Matrix: fine grained 8. Secondary Minerals: altered Ol 9. Encrustations: Mn coating	x	x					GNS	
SO255-DR5-6	1. Rock Type: volcanic, slightly altered, andesite 2. Size: 11x8x9cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, no vesicles 6. Phenocrysts: Fsp small 40%, Px bigger 25%, mm scale 7. Matrix: fine grained 8. Secondary Minerals: altered minerals (sulfides?!) 9. Encrustations: Mn coating	x_air freight box	x					GNS	
SO255-DR5-7	1. Rock Type: volcanic 2. Size: 13x10x13cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Fsp small 40%, Px bigger 25%, mm scale 7. Matrix: fine grained 8. Secondary Minerals: altered minerals (sulfides?!), altered Px 10. Comment: similar to -6	x_air freight box	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR5-8	1. Rock Type: volcanic, strongly altered 2. Size: 13x19x14cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, large vesicles 6. Phenocrysts: Fsp 30%, Px very small 10% 7. Matrix: fine grained 8. Secondary Minerals: large vesicles filled with CC + sulfides, Qtz veins 10. Comment: large Fsp phenocrysts, altered	x_air freight box	x						
SO255-DR5-9	1. Rock Type: volcanic, altered 2. Size: 12x6x11cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey - brownish grey 5. Texture / Vesicularity: porphyric, no vesicular 6. Phenocrysts: mafic minerals (rounded), Fsp 7. Matrix: very fine grained, small Fsp in groundmass	x	x						
SO255-DR5-10	1. Rock Type: volcanic, altered 2. Size: 9x7x9cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicular 6. Phenocrysts: altered minerals 7. Matrix: fine grained, small Fsp in groundmass 8. Secondary Minerals: large vesicles filled with carbonate, sulfides 10. Comment: similar to -8	x	x						
SO255-DR5-11	1. Rock Type: sediment, solidified, probably a crust 2. Size: 28x6x16cm 3. Shape / Angularity: sub-rounded to platy 4. Color of cut surface: yellow brown 5. Texture / Vesicularity: dense 7. Matrix: grain supported matrix, medium grained 9. Encrustations: Mn coating 10. Comment: taken for reference								
SO255-DR5-12	1. Rock Type: carbonate 2. Size: 32x16x13cm 3. Shape / Angularity: rounded, lots of large holes / burrows 4. Color of cut surface: light brown to whitish 5. Texture / Vesicularity: equigranular 7. Matrix: medium grained 9. Encrustations: Mn patches 10. Comment: taken for biostratigraphic age								

SO255-DR6

Description of Location and Structure: Havre Trough, southern profile, conical Seamount E of Colville Ridge, tack from base to top.

Dredge on bottom UTC 05/03/17 17:09hrs, lat 34 05.71'S, long 178 27.24'E, depth 2876m
Dredge off bottom UTC 05/03/17 18:28hrs, lat 34 06.05'S, long 178 26.94'E, depth 2440m
total volume: a single piece of pumice
Comments: Pumice of uncertain origin uncertain; most likely from nearby volcanic front volcano

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR6-1	1. Rock Type: volcanic, pumice 2. Size: 10x6x5cm 3. Shape / Angularity: rounded 4. Color of cut surface: brown 5. Texture / Vesicularity: porous, vesicles 7. Matrix: glassy porous								

SO255-DR7

Description of Location and Structure: Havre Trough; southern profile small circular cone ~3nm ESE of DR6, eastern slope from

Dredge on bottom UTC 05/03/17 21:03hrs, lat 34 06.87'S, long 178 30.32'E, depth 2991m

Dredge off bottom UTC 05/03/17 22:21hrs, lat 34 06.93'S, long 178 29.88'E, depth 2596m

total volume: few lava fragments

Comments: Ol phyric lava with fresh Ol and glass (-1). Apparently no GC and TS were prepared or marked in list for any of the samples. -2 through -4 are significantly more altered and posess thicker Mn crust.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR7-1	1. Rock Type: volcanic, vesicular lava fragment with chilled margin and fresh (!) Ol 2. Size: 10x13x6cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: grey groundmass 5. Texture / Vesicularity: vesicular, 20%, 10% filled 6. Phenocrysts: Ol fresh in many places!, altered Ol along outer oxidized rim 7. Matrix: fine grained, grey, fresh 8. Secondary Minerals: vesicles filled with CC, palagonite along chilled margins 9. Encrustations: 1-2 cm Mn crust 10. Comment: highly vesicular Ol-basalt with fresh Ol and glass. Check Ol for melt inclusions as they deliver about the deeper portions of the magma reservoir	?	?		?				
SO255-DR7-2	1. Rock Type: volcanic, vesicular lava fragment 2. Size: 10x8x6cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: brownish-grey 5. Texture / Vesicularity: vesicular, 20%, 15% filled 6. Phenocrysts: few fresh Ol fresh 7. Matrix: fine grained, grey, fresh 8. Secondary Minerals: vesicles filled with CC, palagonite along chilled margins 9. Encrustations: 1-2 cm Mn crust 10. Comment: similar to -1 but smaller Ol crystals								
SO255-DR7-3	1. Rock Type: volcanic, vesicular lava fragment 2. Size: 7x6x5cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: vesicular, 20% open, 10% filled 6. Phenocrysts: fresh Ol, altered Ol in weathered parts 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with CC, altered Ol, thin palagonite layer chilled margins 9. Encrustations: Mn crust 10. Comment: similar to -2 and -3								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR7-4	1. Rock Type: volcanic, vesicular lava fragment 2. Size: 7x6x4cm 3. Shape / Angularity: sub-angular fragment in rounded Mn-crust 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: vesicular, 20% filled, 10% open 6. Phenocrysts: Ol 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with CC 9. Encrustations: thin palagonite rim, 2cm thick Mn crust 10. Comment: similar to -2 and -3								

SO255-CTD8

Description of Location and Structure: Havre Trough; deep basin in W portion of Havre Trough

CTD in Water UTC 06/03/17 00:13hrs, lat 34 13.95'S, long 178 26.96'E, depth 3538m

CTD on deck UTC 06/03/17 03:00hrs, lat 34 13.96'S, long 178 26.96'E, depth 3538m

SO255-DR9

Description of Location and Structure: Havre Trough; SW-NE trending at the SE margin of a small basin. NW-flank from top to bottom

Dredge on bottom UTC 06/03/21 04:47hrs, lat 34 18.21'S, long 178 23.92'E, depth 3542m

Dredge off bottom UTC 06/03/17 06:08hrs, lat 34 18.51'S, long 178 24.24'E, depth 3134m

total volume: empty

SO255-DR10

Description of Location and Structure: Havre Trough; second attempt at ridge along the SE margin at a small basin ~2nm NE of DR9, northern section of SE-flank from bottom to top

Dredge on bottom UTC 06/03/17 09:06hrs, lat 34 16.84'S, long 178 26.43'E, depth 3317m

Dredge off bottom UTC 06/03/17 10:19hrs, lat 34 16.88'S, long 178 25.96'E, depth 2957m

total volume: empty

SO255-DR11

Description of Location and Structure: Havre Trough; conical seamount N of Gill Seamount. SE slope from near bottom to top

Dredge on bottom UTC 06/03/17 13:33hrs, lat 34 29.91'S, long 178 22.19'E, depth 2665m

Dredge off bottom UTC 06/03/17 14:55hrs, lat 34 30.22'S, long 178 21.87'E, depth 2273m

total volume: empty

SO255-DR12

Description of Location and Structure: Havre Trough; Gill Seamount. SE flank beneath ridge near base

Dredge on bottom UTC 06/03/17 17:33hrs, lat 34 38.91'S, long 178 22.80'E, depth 2482m

Dredge off bottom UTC 06/03/17 18:48hrs, lat 34 38.59'S, long 178 22.52'E, depth 2094m

total volume: 1/3 full

Comments: fresh Ol basalt possible Fsp (-3) and Px (-5 and -8)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR12-1	1. Rock Type: volcanic, unaltered Ol basalt, block B 2. Size: 25x17x13cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: black 5. Texture / Vesicularity: 15% vesicularity 6. Phenocrysts: 5% Ol, <1% xenocrysts 7. Matrix: fine grained 8. Secondary Minerals: none 9. Encrustations: <1mm Mn crust	x_air freight box	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR12-2	1. Rock Type: volcanic, Ol basalt, block A 2. Size: 22x17x13cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicularity, graded vesicles 6. Phenocrysts: Ol, fresh <2%; Plg? 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: olivine xenoliths up to 3.5mm (bubble free rim), possible quench margin around. Xenoliths with blueish olivine + small Px? ± Plg	x	x					GNS, J.Gill, UTAS	
SO255-DR12-3	1. Rock Type: volcanic, Ol basalt 2. Size: 13x9x8cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: black 5. Texture / Vesicularity: 30-40% vesicles 6. Phenocrysts: Ol, fresh <2%; Plg? 7. Matrix: fine grained 10. Comment: brecciated margin, bblueish xenoliths up to 1cm	x_air freight box	x					GNS	
SO255-DR12-4	1. Rock Type: volcanic, Ol basalt 2. Size: 11x8x8cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 40% vesicles 6. Phenocrysts: Ol, fresh <1%, up to 2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: < 1% xenoliths	x	x						
SO255-DR12-5	1. Rock Type: volcanic, basalt 2. Size: 9x7x6cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicularity 6. Phenocrysts: Ol, fresh <1%, Px <1%, <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x_air freight box	x						
SO255-DR12-6	1. Rock Type: volcanic, basalt 2. Size: 5x6x6cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: <30% vesicularity 6. Phenocrysts: Ol, fresh <1%, <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x						
SO255-DR12-7	1. Rock Type: volcanic, basalt 2. Size: 8x9x6cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicularity 6. Phenocrysts: Ol, Px? 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR12-8	1. Rock Type: volcanic, basalt 2. Size: 6x7x5cm 3. Shape / Angularity: 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicularity 6. Phenocrysts: Ol, Px 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x						

SO255-NET13

Description of Location and Structure: Havre Trough; Gill Seamount. SE flank beneath ridge near base

Net in water UTC 06/03/17 20:45hrs, lat 34 32.20'S, long 178 30.54'E, depth 2800m

Net on deck UTC 06/03/17 21:44hrs, lat 34 32.17'S, long 178 30.52'E, depth 2775m

SO255-DR14

Description of Location and Structure: Havre Trough; Small cone in the central Havre Trough, S flank from base to top

Dredge on bottom UTC 06/03/17 22:16hrs, lat 34 32.15'S, long 178 30.53'E, depth 2779m

Dredge off bottom UTC 06/03/17 23:28hrs, lat 34 31.83'S, long 178 30.41'E, depth 2416m

total volume: few rocks

Comments: Ol-Px basalt, moderately altered with 1cm Mn crust

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR14-1	1. Rock Type: volcanic, basalt, altered 2. Size: 25x24x15cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 25-30% vesicles 6. Phenocrysts: Ol, 7%, Px 7% 7. Matrix: fine grained 9. Encrustations: 1cm Mn crust	x_air freight box	x					GNS	
SO255-DR14-2	1. Rock Type: volcanic, basalt 2. Size: 36x29x22cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Ol, 5%, Px 7% 7. Matrix: fine grained 9. Encrustations: 5mm Mn crust	x_air freight box	x					GNS	
SO255-DR14-3	1. Rock Type: volcanic, basalt 2. Size: 12x11x6cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Ol, <5%, Px 7% 7. Matrix: fine grained 9. Encrustations: 5mm Mn crust	x	x						
SO255-DR14-4	1. Rock Type: volcanic, basalt 2. Size: 9x7x4cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Ol, <5%, Px 2% 7. Matrix: fine grained 9. Encrustations: 2mm Mn crust								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR14-5	1. Rock Type: volcanic, basalt 2. Size: 5x7x3cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Ol, 5%, Px 2%								

SO255-DR15

Description of Location and Structure: SW-NE trending ridge in the centrak Havre Trough, SE flank from base to top

Dredge on bottom UTC 07/03/17 02:15hrs, lat 34 24.96'S, long 178 35.12'E, depth 2965m

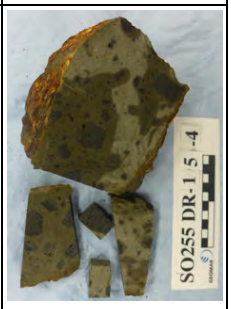
Dredge off bottom UTC 06/03/17 03:43hrs, lat 34 24.71'S, long 178 33.72'E, depth 2504m

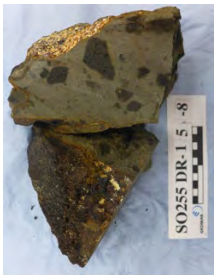
total volume: full

Comments: pumice plus a single large bock (B) of pillow breccia embedded in volcanic breccia that contains abundant fresh glass shards. Samples 1 - 10 are from block B (64x40x24 cm) and 13 - 15 are representative pumice clasts. All samples fromblock B (1-10) are still very wet and need to be dried before further processing such as crushing.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR15-1	1. Rock Type: volcanic, pillow fragment within hyaloclastite matrix, part of block B 64x40x24) as all samples till -10 2. Size: 25x24x15cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 25-30% vesicles 6. Phenocrysts: Ol, 7%, Px 7% 7. Matrix: fine grained 9. Encrustations: 1cm Mn crust	x_air freight box	x					GNS	
SO255-DR15-2	1. Rock Type: volcanic, lava fragment, no visible chilled margin 2. Size: 18x15x12cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: vesicles 10-15%, partly filled (3%) with sediment 6. Phenocrysts: few Fsp, <1%, otherwise mostly aphyric 7. Matrix: fine grained, hyaloclastite; fragments: glassy highly vesicular 8. Secondary Minerals: filled vesicles contain sediment 9. Encrustations: see -1 10. Comment: part of block B, fresh glass only attached in hyaloclastite, fairly large GC slab ---> good for bulk rock geochemistry	x_air freight box	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR15-3	1. Rock Type: volcanic, pillow lava fragment with glassy rim along with lava fragments of variable size in hyaloclastite matrix, part of block B, overall similar to -1 & 2 2. Size: 22x15x12cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: see -1 5. Texture / Vesicularity: pillow fragment with glassy rim with vesicles, lava fragments of different size show different vesicularity (5-20%) 6. Phenocrysts: mostly aphyric, few Fsp, <1%, <1mm 7. Matrix: see -2 8. Secondary Minerals: few vesicles contain sediment 9. Encrustations: 1-2 cm Mn crust 10. Comment: part of block B	x	x					UTAS	
SO255-DR15-4	1. Rock Type: volcanic, medium to small lava fragments without glassy margins 2. Size: 22x27x12cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: fragments show different vesicularity (5-20%) 6. Phenocrysts: see sample 2 7. Matrix: see -2 8. Secondary Minerals: 9. Encrustations: 1-2 cm Mn crust 10. Comment: part of block B, two TS billets lava fragment % matrix	2x_air freight box						GNS	
SO255-DR15-5	1. Rock Type: volcanic, medium to small lava fragments in hyaloclastite matrix 2. Size: 21x15x12cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: fragments show different vesicularity (5-30%), and different sizes of vesicles 6. Phenocrysts: see -2 7. Matrix: see -2 8. Secondary Minerals: see -3 9. Encrustations: see -1 10. Comment: two TS billets	2x							
SO255-DR15-6	1. Rock Type: volcanic, medium to small lava fragments 2. Size: 20x16x12cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: see -5 6. Phenocrysts: see -2 7. Matrix: see -2 8. Secondary Minerals: 9. Encrustations: see -1 10. Comment: two TS billets, part of block B	2x						GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR15-7	1. Rock Type: volcanic, medium to small lava fragments (5 - 1 cm) 2. Size: 21x11x10cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: see -5 6. Phenocrysts: mostly aphyric, few fresh Fsp (1%, <1mm), few Ol?! (1%, <1mm) 7. Matrix: see -2 8. Secondary Minerals: 9. Encrustations: see -1 10. Comment: no TS, no GC, part of block B								
SO255-DR15-8	1. Rock Type: volcanic, lava fragments within hyaloclastite matrix 2. Size: 29x18x10cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: see -5 6. Phenocrysts: see -2 7. Matrix: see -2 8. Secondary Minerals: 9. Encrustations: see -1 10. Comment: no TS, no GC, part of block B							GNS	
SO255-DR15-9	1. Rock Type: volcanic, lava fragments within hyaloclastite matrix 2. Size: 18x9x9cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: see -5 6. Phenocrysts: see -7 7. Matrix: see -2 8. Secondary Minerals: 9. Encrustations: see -1 10. Comment: no TS, no GC, part of block B								
SO255-DR15-10	1. Rock Type: volcanic, lava fragments within hyaloclastite matrix 2. Size: 13x11x8cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: see -5 6. Phenocrysts: see -2 7. Matrix: see -2 8. Secondary Minerals: 9. Encrustations: see -1 10. Comment: GC from a single lava frgament, part of block B	x	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR15-11	1. Rock Type: volcanic, lava fragments in hyaloclastite matrix 2. Size: 12x12x5cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: dark grey in fragment, matrix grey-green 5. Texture / Vesicularity: fragments show different vesicularity (5-20%) and different size of vesicles, vesicles partly filled with sediment 6. Phenocrysts: mostly aphyric 7. Matrix: fine grained, hyaloclastite, fragments highly vesicular 8. Secondary Minerals: 9. Encrustations: thin Mn crust 10. Comment: this piece was separate from block B samples but is very similar to those, no GC, no TS								
SO255-DR15-12	1. Rock Type: volcanic, pumice, highly vesicular volcanic glass 2. Size: 27x22x15cm 3. Shape / Angularity: rounded 4. Color of cut surface: beige, grey, pale 5. Texture / Vesicularity: porous, vesicular, glassy, vesicles (30-50%) 6. Phenocrysts: felsic minerals (pyroxenes?), <1%, <1mm 7. Matrix: glassy porous	x							
SO255-DR15-13	1. Rock Type: volcanic, pumice, highly vesicular volcanic glass 2. Size: 26x16x13cm 3. Shape / Angularity: rounded 4. Color of cut surface: beige, grey, pale 5. Texture / Vesicularity: porous, vesicular, glassy, vesicles (30-50%) 6. Phenocrysts: felsic minerals (pyroxenes?), <1%, <1mm 7. Matrix: glassy porous	x							
SO255-DR15-14	1. Rock Type: volcanic, pumice, highly vesicular volcanic glass 2. Size: 27x17x20cm 3. Shape / Angularity: rounded 4. Color of cut surface: beige, grey, pale 5. Texture / Vesicularity: porous, vesicular, glassy, vesicles (30-50%) 6. Phenocrysts: felsic minerals (pyroxenes?), <1%, <1mm 7. Matrix: glassy porous	x						GNS	

SO255-DR16

Description of Location and Structure: Havre Trough, SW-NE trending ridge at the NW margin of a small basin in the central H.T. SW flank from base to upper section of the top

Dredge on bottom UTC 07/03/17 02:15hrs, lat 34 15.13'S, long 178 41.44'E, depth 3380m

Dredge off bottom UTC 07/03/17 08:12hrs, lat 34 14.88'S, long 178 41.20'E, depth 2957m

total volume: empty

SO255-DR17

Description of Location and Structure: Havre Trough, 3nm SW of DR18; NE-SW elongated ridge, SE facing slope from mid section to almost top

Dredge on bottom UTC 07/03/17 10:47hrs, lat 34 17.55'S, long 178 39.29'E, depth 2875m

Dredge off bottom UTC 07/03/17 12:05hrs, lat 34 17.16'S, long 178 39.14'E, depth 2472m

total volume: 1/5full

Comments: pumice, some have mm thick Mn crust

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR17-1	1. Rock Type: volcanic, pumice, medium altered 2. Size: 20x12x9cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: light grey, small black minerals (<1%), brown when altered 5. Texture / Vesicularity: highly porous, 50%, vesicle size varies ---> mm - cm 6. Phenocrysts: small, black, needle like minerals (mm) 7. Matrix: glassy matrix highly porous 10. Comment: freshest sample of the dredge	x						GNS	
SO255-DR17-2	1. Rock Type: volcanic, pumice, similar to -1 2. Size: 17x9x9cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: see -1 6. Phenocrysts: see -1 7. Matrix: see -1 10. Comment: similar degree of alteration as -1	x							
SO255-DR17-3	1. Rock Type: volcanic, pumice, strongly altered 2. Size: 18x11x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to brown with increasing degree of alteration towards outside 5. Texture / Vesicularity: see -1 6. Phenocrysts: see -1 7. Matrix: see -1 8. Secondary Minerals: 10. Comment: similar degree of alteration as -1	x						GNS	
SO255-DR17-4	1. Rock Type: volcanic, pumice, strongly altered 2. Size: 21x18x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to brown with increasing degree of alteration towards outside 5. Texture / Vesicularity: see -1 6. Phenocrysts: small black 7. Matrix: glassy matrix, highly porous 9. Encrustations: partially encrusted with 1-1.5 cm Mn	x							
SO255-DR17-5	1. Rock Type: see -3 2. Size: 11x6x5cm 3. Shape / Angularity: see -3 4. Color of cut surface: see -3 5. Texture / Vesicularity: see -1 6. Phenocrysts: see -3 7. Matrix: see -3 9. Encrustations: Mn-crust 0.5 - 1 cm, crust partially invades pores	x							

SO255-DR18

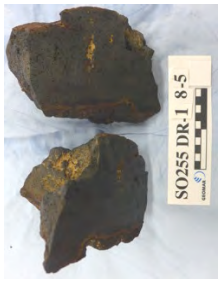
Description of Location and Structure: Havre Trough, southern profile, central area, oval shaped seamount dissected by NE-SW striking faults. Dredge track along S facing slope in mid-section. Base diameter of volcano ~8km

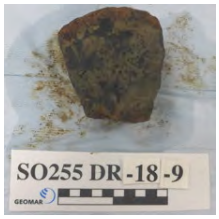
Dredge on bottom UTC 07/03/17 10:47hrs, lat 34 17.55'S, long 178 39.29'E, depth 2875m

Dredge off bottom UTC 07/03/17 12:05hrs, lat 34 17.16'S, long 178 39.14'E, depth 2472m

total volume: few rocks

Comments: slightly altered Px phyric lava

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR18-1	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 40x40x40cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Px 5% 7. Matrix: fine grained 9. Encrustations: <5mm Mn crust 10. Comment: fresh Px, glassy margin	x_air freight box	x		Gl			GNS	
SO255-DR18-2	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 22x19x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Px 5% 7. Matrix: fine grained 9. Encrustations: <8mm Mn crust 10. Comment: fresh Px, <2mm glassy margin	x	x		Gl			GNS	
SO255-DR18-3	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 22x10x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 25% vesicles 6. Phenocrysts: Px 5%, Plg?, Ol <1% 7. Matrix: fine grained 9. Encrustations: <8mm Mn crust 10. Comment: fresh Px, <2mm glassy margin	x_air freight box	x		Gl			GNS	
SO255-DR18-4	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 24x16x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 15-20% vesicles 6. Phenocrysts: Px <1% 7. Matrix: fine grained 9. Encrustations: 0.5 cm Mn crust 10. Comment: 2mm glassy margin	x	x		Gl			GNS	
SO255-DR18-5	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 20x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 25% vesicles 6. Phenocrysts: Px <1% 7. Matrix: fine grained 9. Encrustations: <1 cm Mn crust 10. Comment: <2mm glassy margin								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR18-6	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 15x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Px 2-3% 7. Matrix: fine grained 9. Encrustations: <5mm Mn crust 10. Comment: <2mm glass, fresh Px	x	x		Gl				
SO255-DR18-7	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 13x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Px <5%, <1% Ol 7. Matrix: fine grained 9. Encrustations: <4mm Mn crust 10. Comment: <1mm glass								
SO255-DR18-8	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 10x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: <1% Ol, <2% Px 7. Matrix: fine grained 9. Encrustations: <2mm Mn crust 10. Comment: <2mm glass								
SO255-DR18-9	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 9x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 5% Px 7. Matrix: fine grained 9. Encrustations: <1cm Mn crust 10. Comment: <2mm glass								

SO255-DR19

Description of Location and Structure: Havre Trough, small cone in the central Havre Trough, S flank from base to top

Dredge on bottom UTC 07/03/17 10:47hrs, lat 34 24.99'S, long 179 1.97'E, depth 2015m

Dredge off bottom UTC 07/03/17 20:46hrs, lat 34 24.62'S, long 179 1.93'E, depth 1666m

total volume: one large rock, few medium sized rocks

Comments: slightly altered Plg phyric lava with minor Ol. Fresh glassy margins -1 to -3

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR19-1	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 67x51x41cm original size of block A 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 25-30% vesicles 6. Phenocrysts: Plg 15-20%, up to 5mm, Ol <1% 7. Matrix: fine grained 9. Encrustations: <2mm Mn crust 10. Comment: fresh Ol and Plg, some Plg altered, one Plg xenocrystics? 7mm, rounded and more altered than the others. Glassy margin	x_air freight box	x		x			GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR19-2	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 26x21x19cm original size of block B 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 30-40% vesicles 6. Phenocrysts: Plg 15%, up to 6mm, Ol <2% 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Ol and Plg, <1mm glass margin	x	x		x			GNS	
SO255-DR19-3	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 24x15x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Plg 10-15%, < 7mm, Ol <1% 7. Matrix: fine grained 9. Encrustations: <2mm Mn crust 10. Comment: fresh Ol and Plg	x_air freight box	x		x			GNS	
SO255-DR19-4	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 15x10x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 40-50% vesicles 6. Phenocrysts: Plg <2%, 3mm, Ol <1% 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Plg and Ol	x	x					GNS	
SO255-DR19-5	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 14x10x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20-30% vesicles 6. Phenocrysts: Plg 10-15%, up to 5mm, Ol <1% 7. Matrix: fine grained 9. Encrustations: <5mm Mn crust 10. Comment: fresh Plg and Ol	x	x						
SO255-DR19-6	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 11x9x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Plg 10%, Ol <1% 7. Matrix: fine grained 9. Encrustations: 3mm Mn crust 10. Comment: partly filled vesicles								
SO255-DR19-7	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 12x12x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 40% vesicles 6. Phenocrysts: Plg 5%, Ol 1% 7. Matrix: fine grained 9. Encrustations: 2mm Mn-crust 10. Comment: partly filled vesicles								

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR19-8	1. Rock Type: volcanic, basalt 2. Size: 15x10x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 40% vesicles 6. Phenocrysts: Plg 7%, Ol 1% 7. Matrix: fine grained 9. Encrustations: 2mm Mn-crust 10. Comment: brecciated crust, chilled margin, fresh Plg & Ol							GNS	
SO255-DR19-9	1. Rock Type: volcanic, basalt 2. Size: 20x16x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20-30% vesicles, some filled near rim 6. Phenocrysts: Plg 10% up to 6mm 7. Matrix: fine grained 8. Secondary Minerals: grey filling of vesicles 9. Encrustations: <2mm Mn-crust 10. Comment: fresh Plg							GNS	
SO255-DR19-10	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 20x16x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicles, graded vesicles 6. Phenocrysts: Plg 10%, Ol 1% 7. Matrix: fine grained 8. Secondary Minerals: grey filling of vesicles 9. Encrustations: 2mm Mn-crust 10. Comment: glassy chilled margin								
SO255-DR19-11	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 16x10x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: 20-30% vesicles, graded vesicles 6. Phenocrysts: Plg 10%, <7mm, Ol? 7. Matrix: fine grained 9. Encrustations: 1mm Mn-crust 10. Comment: fresh Plg								
SO255-DR19-12	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 13x11x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Plg 10% up to 8mm, <1%, Ol 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: 1mm Mn-crust 10. Comment: fresh Plg								

SO255-DR20

Description of Location and Structure: Havre Trough, small cone in the eastern section of Havre Trough, S flank from base to top

Dredge on bottom UTC 07/03/17 22:59hrs, lat 34 30.47'S, long 179 5.81'E, depth 1926m

Dredge off bottom UTC 08/03/17 00:13hrs, lat 34 30.09'S, long 179 5.73'E, depth 1587m

total volume: 1/4 full, one large rock

Comments: slightly altered Px phyric lava with subordinate occurences of Ol and Plg in some samples. No glassy margins obeserved

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR20-1	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 47x45x49cm original size of block A 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Px 20-30%, Ol <1% 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Ol and Px, MI study on Ol?	x_air freight box	x		Ol +Px			GNS	
SO255-DR20-2	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 17x20x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20-25% vesicles 6. Phenocrysts: fresh Ol <1mm, <2%, relatively fresh Px 7-10%, <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Ol, MI study on Ol?	x	x					GNS	
SO255-DR20-3	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 15x26x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: 10-15% vesicles 6. Phenocrysts: Px 10-15%, fresh Ol <1%, Plg? 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x_air freight box	x					GNS	
SO255-DR20-4	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 33x20x20cm original size of block S 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 30-40% vesicles 6. Phenocrysts: Px 15%, Ol <1% 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR20-5	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 24x14x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: 15-20% vesicles 6. Phenocrysts: Px 10-15%, Ol <1%, Plg? 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Ol, MI study?	x	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR20-6	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 20x12x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 25-30% vesicles 6. Phenocrysts: Px 15%, Ol <1%, Plg? 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x						
SO255-DR20-7	1. Rock Type: volcanic, basalt 2. Size: 15x11x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: 25% vesicles 6. Phenocrysts: Px 7%, Ol 1%, Plg <1% 7. Matrix: fine grained								
SO255-DR20-8	1. Rock Type: volcanic, basalt 2. Size: 17x6x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Px 10%, Ol <1%, Plg 1% 7. Matrix: fine grained							GNS	
SO255-DR20-9	1. Rock Type: volcanic, basalt 2. Size: 16x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 35% vesicles 6. Phenocrysts: Px 10%, Ol 3% 7. Matrix: fine grained								
SO255-DR20-10	1. Rock Type: volcanic, basalt 2. Size: 11x15x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Px 7%, Ol 1% 7. Matrix: fine grained								
SO255-DR20-11	1. Rock Type: volcanic, basalt 2. Size: 14x11x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Px 7%, Ol <1% 7. Matrix: fine grained							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR20-12	1. Rock Type: volcanic, basalt 2. Size: 14x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 15% vesicles 6. Phenocrysts: Px 4%, Ol <1% 7. Matrix: fine grained 10. Comment: largest vesicles focused at end of sample, contain unknown black substance with around 30% vesicles <1mm								

SO255-DR21

Description of Location and Structure: Havre Trough / Volcanic Front; Kible White Complex. Northenmost large cone, southern flank from base to top.

Dredge on bottom UTC 08/03/17 02:30hrs, lat 34 28.01'S, long 179 13.96'E, depth 1795m

Dredge off bottom UTC 08/03/17 03:44hrs, lat 34 27.63'S, long 179 14.03'E, depth 1379m

total volume: 3/4 full

Comments: fresh, slightly phyric lava with variable amounts of Ol-Px-Fsp, glassy margins in some samples

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR21-1	1. Rock Type: volcanic, basalt, no alteration 2. Size: 20x14x13cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 25% vesicles, up to 1cm, small vesicles 40% total 6. Phenocrysts: Px <5%, Ol ~1%, both 1mm 7. Matrix: highly vesicular aphyric + phenocrysts 9. Encrustations: glass rim up to 1cm 10. Comment: glass rim cut off for further processing and saved in extra bag	2x_air freight box	x		GL			GNS	
SO255-DR21-2	1. Rock Type: volcanic, basalt, no alteration 2. Size: 15x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40-50% vesicles, up to 0.5cm, variable vesicles sizes 6. Phenocrysts: Px <3%, Fsp 1%, up to 3mm 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to 1cm 10. Comment: different sizes of vesicles in different cooling areas; glass rim cut off	2x_air freight box	x		GL			GNS	
SO255-DR21-3	1. Rock Type: volcanic, basalt, no alteration 2. Size: 14x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, up to 0.5cm, variable sizes 6. Phenocrysts: Px 5%, Ol <2%, up to 2mm 7. Matrix: aphyric, highly vesicular + larger phenocrysts 9. Encrustations: glass rim up to 0.5cm 10. Comment: glass rim cut off	x	x		GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR21-4	1. Rock Type: volcanic, basalt, no alteration 2. Size: 15x14x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30-40% vesicles, vesicle horizons 6. Phenocrysts: Ol <3%, Px <1%, up to 2mm 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to 0.5cm 10. Comment: vesicles demonstrate the different cooling horizons, glass rim cut off	x	x		GL				
SO255-DR21-5	1. Rock Type: volcanic, basalt, no alteration 2. Size: 15x12x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30% vesicles, up to 3mm, phenocrysts 6. Phenocrysts: Px <3%, Ol <1%, Fsp <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to 0.5cm 10. Comment: glass rim cut off	x_air freight box	x		GL			GNS	
SO255-DR21-6	1. Rock Type: volcanic, basalt, no alteration 2. Size: 23x14x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, small and large up to 1cm 6. Phenocrysts: Px <3%, Ol <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: no glass rim	x	x		GL				
SO255-DR21-7	1. Rock Type: volcanic, basalt, no alteration 2. Size: 13x13x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 50% vesicles, up to 2cm 6. Phenocrysts: Px <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to 0.5cm	x	x		2xGL			GNS	
SO255-DR21-8	1. Rock Type: volcanic, basalt, no alteration 2. Size: 9x8x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, up to 5mm 6. Phenocrysts: Fsp 5%, Ol <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to 0.5cm 10. Comment: large Fsp up to 4mm	x	x	2	GL				
SO255-DR21-9	1. Rock Type: volcanic, basalt, no alteration 2. Size: 13x10x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, up to 2mm 6. Phenocrysts: Ol <2%, Fsp <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to 3mm				GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR21-10	1. Rock Type: volcanic, basalt, no alteration 2. Size: 8x7x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30-40% vesicles, only small vesicles <1mm 6. Phenocrysts: Fsp <5%, up to 2-4mm, Ol <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to 5mm 10. Comment: large Fsp, good for dating			2	GL				
SO255-DR21-11	1. Rock Type: volcanic, basalt, no alteration 2. Size: 17x18x14cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30-40% vesicles, only small vesicles <1mm 6. Phenocrysts: Fsp <5%, Px <1%, Ol <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to 5mm 10. Comment: cut of glass rim, two pieces, small Fsp	x	x	3	GL			GNS	
SO255-DR21-12	1. Rock Type: volcanic, basalt, no alteration 2. Size: 15x14x12cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 50% vesicles, up to 5mm 6. Phenocrysts: Fsp <5%, Px <1%, Ol <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to 5mm 10. Comment: cut of glass rim, Fsp up to 3mm	x	x	2-3	GL				
SO255-DR21-13	1. Rock Type: volcanic, basalt, no alteration 2. Size: 17x13x12cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, up to 2mm 6. Phenocrysts: Fsp, Px, Ol <3%, ~1mm 7. Matrix: aphyric, highly vesicular + phenocrysts very small 9. Encrustations: glass rim up to ~4mm 10. Comment: small vesicles, cut of glass rim	x_air freight box	x	2	GL			GNS	
SO255-DR21-14	1. Rock Type: volcanic, basalt, no alteration 2. Size: 21x18x14cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, up to 5mm 6. Phenocrysts: Fsp ~5%, up to 4mm 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: glass rim up to ~3mm 10. Comment: large fresh Fsp, vesicles show cooling horizons, cut of glass rim	x	x	1-2	GL			GNS	
SO255-DR21-15	1. Rock Type: volcanic, basalt, no alteration 2. Size: 25x13x12cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 50% vesicles, up to 1.5cm 6. Phenocrysts: large Fsp ~5%, up to 5mm 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: thick glass up to 2cm 10. Comment: large fresh Fsp for dating, cut of glass rim			1-2	GL				

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR21-16	1. Rock Type: volcanic, basalt, no alteration 2. Size: 14x9x9cm 3. Shape / Angularity: sub-rounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, up to 1cm, small and large vesicles 6. Phenocrysts: large Fsp ~3%, up to 5mm 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: thick glass rim ~5mm 10. Comment: cut of glass rim			2	GL				
SO255-DR21-17	1. Rock Type: volcanic, basalt, no alteration 2. Size: 14x13x16cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 50% vesicles, up to 1cm 6. Phenocrysts: large Fsp ~5%, up to 4mm 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: thick glass rim up to 5mm 10. Comment: sample got cut just into to halfs			2					
SO255-DR21-18	1. Rock Type: volcanic, basalt, no alteration 2. Size: 15x13x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40-50% vesicles, up to 1cm, irregular distributed 6. Phenocrysts: Fsp ~3%, up to 5mm 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: thick glass rim up to 5mm 10. Comment: cutt off glass rim				GL				
SO255-DR21-19	1. Rock Type: volcanic, basalt, no alteration 2. Size: 10x9x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40-50% vesicles, up to 0.5cm 6. Phenocrysts: Fsp ~3%, up to 4mm, Ol & Px <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: thin glass rim up to 5mm 10. Comment: sample just got cut into two halfs			2-3					
SO255-DR21-20	1. Rock Type: volcanic, basalt, no alteration 2. Size: 11x10x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, larger vesicles towards rim 6. Phenocrysts: Fsp ~3%, Px <1% 7. Matrix: aphyric, highly vesicular + phenocrysts 9. Encrustations: thin glass rim up to 5mm 10. Comment: sample just got cut into two halfs			2-3					

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR21-21	1. Rock Type: volcanic, basalt, interface of two flows? 2. Size: 13x12x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey brown 5. Texture / Vesicularity: 40% vesicles, up to 2mm, smaller vesicles in one of the flows 6. Phenocrysts: Fsp ~1%, minor Ol & Px?! 7. Matrix: aphyric, highly vesicular 9. Encrustations: no glass rim 10. Comment: sample differs from sample -1 to -20, by much fewer phenocrysts in flow with less lesser and smaller vesicles, basalt overridden by another basalt flow								
SO255-DR21-22	1. Rock Type: volcanic, basalt, no alteration 2. Size: 11x8x8cm 3. Shape / Angularity: well rounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30% vesicles, up to 1mm, smaller vesicles in one of the flows 6. Phenocrysts: Fsp, Px and Ol ~2-3%, up to 1mm 7. Matrix: aphyric 9. Encrustations: thin Mn? crust on one side (~5mm) 10. Comment: sample differs in shape and vesicle / phenocryst size from sample -1 to -20								
SO255-DR21-23	1. Rock Type: volcanic, basalt, no alteration 2. Size: 28x23x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40-50% vesicles, up to 5mm 6. Phenocrysts: Fsp 3%, up to 2mm; Px <1% 7. Matrix: aphyric, highly vesicular 9. Encrustations: thick glass rim 1-2cm 10. Comment: glass chisseled off divided between GEOMAR and GNS	x_air freight box	x		GL			GNS	
SO255-DR21-24	1. Rock Type: volcanic, basalt 2. Size: 25x20x14cm 3. Shape / Angularity: rounded, pillow shape 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30-40% vesicles, up to 5mm 6. Phenocrysts: small Fsp + Px, ~3%, up to 1mm 7. Matrix: aphyric, highly vesicular 9. Encrustations: thick glass rim 1cm 10. Comment: nice pillow shape and glass rim	x	x					GNS	
SO255-DR21-25	1. Rock Type: volcanic, basalt, no alteration 2. Size: two pieces from block C, original size 35x26x24cm, piece 1) 17x13x12cm; piece 2) 17x16x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, up to 4mm 6. Phenocrysts: Px, ~3%, up to 5mm, Fsp <1% 7. Matrix: aphyric, highly vesicular 9. Encrustations: glass rim 0.5 cm 10. Comment: large, nice Px; cut off glass rim, two pieces	x	x						

SO255-DR22

Description of Location and Structure: Havre Trough / Volcanic Front; Kible White Complex. Medium sized cone next to DR21 cone, upper portion of S flank

Dredge on bottom UTC 08/03/17 05:46hrs, lat 34 29.87'S, long 179 14.35'E, depth 1787m

Dredge off bottom UTC 08/03/17 07:00hrs, lat 34 29.48'S, long 179 14.28'E, depth 1386m

total volume: few rocks

Comments: fresh Px-Plg phyric lava with glassy margins

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR22-1	1. Rock Type: volcanic, basalt, no alteration 2. Size: 17x17x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, large vesicles concentrated at cooling horizons 6. Phenocrysts: Px 10%, up to 5mm Fsp ~3%, up to 3mm, Ol <1% 7. Matrix: aphyric, highly vesicular 9. Encrustations: thin glass rim ~5mm 10. Comment: nice fresh phenocrysts, large Px (green), cut off glass rim	x_air freight box	x	3	GL			JAMSTEC, GNS	
SO255-DR22-2	1. Rock Type: volcanic, basalt, no alteration 2. Size: 9x9x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, large vesicles concentrate at cooling horizons 6. Phenocrysts: Px <7%, Fsp ~3% 7. Matrix: aphyric, highly vesicular 9. Encrustations: thin glass rim ~5mm 10. Comment: fresh phenocrysts, cut off glass rim	x_air freight box	x		GL			JAMSTEC	
SO255-DR22-3	1. Rock Type: volcanic, basalt, no alteration 2. Size: 24x16x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30-40% vesicles, up to 1cm, large and small vesicles 6. Phenocrysts: Px 3%, up to 5mm; Fsp and Ol <1% 7. Matrix: aphyric, highly vesicular 9. Encrustations: no glass rim 10. Comment: fresh material	x	x					JAMSTEC, GNS	
SO255-DR22-4	1. Rock Type: volcanic, basalt, no alteration 2. Size: 13x10x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30-40% vesicles, up to 5mm, large and small vesicles 6. Phenocrysts: Fsp ~3%, up to 5mm; Ol <1% up to 1mm 7. Matrix: aphyric, highly vesicular 9. Encrustations: no glass rim 10. Comment: fresh material	x_air freight box	x					JAMSTEC	
SO255-DR22-5	1. Rock Type: volcanic, basalt, no alteration 2. Size: 12x9x7cm 3. Shape / Angularity: rounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40-50% large vesicles 6. Phenocrysts: Fsp <3%, up to 4mm; Ol <1% 7. Matrix: aphyric, highly vesicular 9. Encrustations: no glass rim 10. Comment: sample just cut in half			3				JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR22-6	1. Rock Type: volcanic, basalt, no alteration 2. Size: 8x8x4cm 3. Shape / Angularity: rounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% small vesicles, up to 2mm 6. Phenocrysts: Px 5%, up to 5mm; Fsp <5% up to 3mm 7. Matrix: aphyric, highly vesicular 9. Encrustations: no glass rim 10. Comment: sample just cut in half			3-4				JAMSTEC	
SO255-DR22-7	1. Rock Type: volcanic, basalt 2. Size: 8x7x4cm 3. Shape / Angularity: rounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30-40% vesicles, mainly small with few large ones 6. Phenocrysts: Fsp 5%, up to 4mm; Ol <1% 7. Matrix: aphyric, highly vesicular 9. Encrustations: very thin glass rim ~2mm			3				JAMSTEC	

SO255-DR23

Description of Location and Structure: Havre Trough / Volcanic Front; Kible White Complex. Little oval shaped cone few miles E of DR22.

Dredge on bottom UTC 08/03/17 09:09hrs, lat 34 29.79'S, long 179 17.35'E, depth 2476m

Dredge off bottom UTC 08/03/17 10:12hrs, lat 34 29.46'S, long 179 17.33'E, depth 2242m

total volume: few rocks

Comments: slightly Px-Fsp (-1 to -3) and Px-Ol (-4) phyric lava

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR23-1	1. Rock Type: volcanic, basalt 2. Size: 35x15x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30-40% vesicles, up tp 5mm large vesicles concentrated at cooling horizons 6. Phenocrysts: Px 5%, up to 2mm ---> small crystals 7. Matrix: aphyric, highly vesicular 9. Encrustations: variable glass rim up to 1cm 10. Comment: vesicles partly refilled with melt?	x_air freight box	x					JAMSTEC	
SO255-DR23-2	1. Rock Type: volcanic, basalt 2. Size: 11x10x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, up tp 5mm 6. Phenocrysts: Px 3%, up to 2mm; Fsp <1%, ~1mm 7. Matrix: aphyric, highly vesicular 9. Encrustations: glass ~7mm 10. Comment: sample cut into two halfs	x_air freight box	x					JAMSTEC	
SO255-DR23-3	1. Rock Type: volcanic, basalt 2. Size: 9x5x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, small and very large vesicles up to 1cm 6. Phenocrysts: Px, Fsp ~3%, up to 1mm 7. Matrix: aphyric, highly vesicular 9. Encrustations: rough Mn crust	x	x					JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR23-4	1. Rock Type: volcanic, Ol-Px basalt, fairly fresh except for partial filling of vugs with soft sediment 2. Size: 38x24x15cm 3. Shape / Angularity: platy, angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: slightly phyric, very large, several cm sized vugs 6. Phenocrysts: Px <3%, <2mm, Ol <1%, <2mm, both fresh 7. Matrix: fine grained with abundant micro vesicles 9. Encrustations: soft sediment attached on one side, however difficult to remove despite watering and brushing; @ home rock should be watered over night to more fully dissolve sediment 10. Comment: from outside the sample looked like Mn crust and was initially described as such. After cutting it became clear that it is a platy Px-Ol basalt, maybe from the top of a lava flow	x	x					JAMSTEC, GNS	

SO255-DR24

Description of Location and Structure: Havre Trough / Volcanic Front; Kible White Complex. Small oval shaped cone, NE-SW elongated, SE flank from bottom to top. Lies in strike of the SW-NE striking fault / ridge that extends from here to the to Kible White Volcano.

Dredge on bottom UTC 08/03/17 12:58hrs, lat 34 29.16'S, long 179 21.76'E, depth 3081m
Dredge off bottom UTC 08/03/17 13:59hrs, lat 34 28.82'S, long 179 21.65'E, depth 2732m
total volume: one rock
Comments: near aphyric lava with sub% Px and Fsp, glass rim mentioned but not separated.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR24-1	1. Rock Type: volcanic, basalt 2. Size: 14x9x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 20% vesicles, up tp 6mm 6. Phenocrysts: only few very small phenocrysts CPx, Fsp? <1%, <1mm ---> small crystals 7. Matrix: aphyric, with micro vesicles 9. Encrustations: variable glass rim up to 1cm 10. Comment: single sample of the dredge	x_missing!	x					JAMSTEC	

SO255-DR25

Description of Location and Structure: Havre Trough / Volcanic Front; Kible White Complex. NE-SW striking ridge extending from DR24 to top of Kible White Volcano. DR25 is at base of K.W. along SE facing slope from bottom to top.

Dredge on bottom UTC 08/03/17 16:39hrs, lat 34 31.03'S, long 179 20.03'E, depth 2885m
Dredge off bottom UTC 08/03/17 17:55hrs, lat 34 30.69'S, long 179 19.89'E, depth 2535m
total volume: 1/5 full
Comments: near aphyric Ol-Px lava with fresh glassy margins

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR25-1	1. Rock Type: volcanic, basalt 2. Size: 50x41x26cm original size of block C 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 1% Ol, 1% Px 7. Matrix: fine grained 9. Encrustations: 4-5mm glass crust	x_air freight box	x		x			JAMSTEC, GNS	
SO255-DR25-2	1. Rock Type: volcanic, basalt 2. Size: 30x28x18cm original size of block S 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 15% vesicles 6. Phenocrysts: 1% Ol, 1% Px 7. Matrix: fine grained 9. Encrustations: 4-5mm glass crust	x_air freight box	x		x			JAMSTEC, GNS	
SO255-DR25-3	1. Rock Type: volcanic, basalt 2. Size: 26x23x20cm original size of block B 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: 1% Ol, 1% Px 7. Matrix: fine grained 9. Encrustations: 2mm glass crust	x	x		x			JAMSTEC, GNS	
SO255-DR25-4	1. Rock Type: volcanic, basalt 2. Size: 12x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 1-2% Ol, 1% Px 7. Matrix: fine grained 9. Encrustations: 0.3-1cm glass crust	x	x		x			JAMSTEC, GNS	
SO255-DR25-5	1. Rock Type: volcanic, basalt 2. Size: 17x10x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 25% vesicles 6. Phenocrysts: 1% Ol, 1% Px 7. Matrix: fine grained	x_air freight box	x		x			JAMSTEC, GNS	
SO255-DR25-6	1. Rock Type: volcanic, basalt 2. Size: 11x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 1% Ol, 1% Px 7. Matrix: fine grained								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR25-7	1. Rock Type: volcanic, basalt 2. Size: 11x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 1% Ol, 1% Px 7. Matrix: fine grained 9. Encrustations: 5mm glass	x	x		x			JAMSTEC	
SO255-DR25-8	1. Rock Type: volcanic, basalt 2. Size: 11x11x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 15% vesicles 6. Phenocrysts: 1% Ol, 1% Px 7. Matrix: fine grained 9. Encrustations: 5mm glass	x	x		x			JAMSTEC	

SO255-DR26

Description of Location and Structure: Havre Trough / Volcanic Front; Kible White Complex, largest cone, upper section of western flank

Dredge on bottom UTC 08/03/17 20:26hrs, lat 34 34.75'S, long 179 14.50'E, depth 1511m

Dredge off bottom UTC 08/03/17 21:43hrs, lat 34 37.71'S, long 179 15.03'E, depth 1150m

total volume: 3/4 full

Comments: Fresh, more evolved dacitic? lava with variable amounts of Plg, Amph and Qtz (-1 to -12). Sample -13 and -30 often contain xenoliths. Note that numbers of archive samples (-X) do not correspond to sample numbers distributed earlier!!

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR26-1	1. Rock Type: volcanic, lava 2. Size: 31x22x14cm 3. Shape / Angularity: rounded 4. Color of cut surface: grey - light grey, some brown staining 5. Texture / Vesicularity: highly porous, 10% vesicularity, small vesicles <1mm 6. Phenocrysts: Fsp; Qtz, Hbl?, MT, <1mm, fresh to slightly altered 7. Matrix: holocrystalline, medium grained 9. Encrustations: sub mm Mn crust 10. Comment: fresh dacitic? lava, likely datable (GM, Fsp, Hbl)	x_air freight box	x		x			JAMSTEC, GNS	
SO255-DR26-2	1. Rock Type: volcanic, slightkly altered 2. Size: 18x11x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black to grey 5. Texture / Vesicularity: 10-20% vesicles 6. Phenocrysts: Plg <1%; Hbl? 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x_air freight box	x					JAMSTEC, GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR26-3	1. Rock Type: volcanic, slightly altered 2. Size: 18x11x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black to grey 5. Texture / Vesicularity: 10-20% vesicles 6. Phenocrysts: Plg <1%; Hbl? 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					JAMSTEC, GNS	
SO255-DR26-4	1. Rock Type: volcanic, slightly altered 2. Size: 13x12x cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 25% vesicles 6. Phenocrysts: Plg 10% 7. Matrix: fine - medium grained 9. Encrustations: <1mm Mn crust	x	x					JAMSTEC, GNS	
SO255-DR26-5	1. Rock Type: volcanic 2. Size: 12x11x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey; 2-5 mm light grey margin 5. Texture / Vesicularity: 7% vesicles 6. Phenocrysts: Amph 10%, Plg 10% 7. Matrix: fine - medium grained 9. Encrustations: <1mm Mn crust 10. Comment: different color margin, not clear if TS, GC has been made!								
SO255-DR26-6	1. Rock Type: volcanic 2. Size: 12x9x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: mostly black, at one side light grey rim, 1cm 5. Texture / Vesicularity: light grey rim 10 %, <2mm, black part 10% vesicles, <1mm 6. Phenocrysts: Fsp, Amph, Qtz 7. Matrix: medium grained	x_air freight box	x					JAMSTEC, GNS	
SO255-DR26-7	1. Rock Type: volcanic, slighty altered 2. Size: 9x7x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 10-15% vesicles 6. Phenocrysts: Amph, Fsp, Qtz 7. Matrix: medium grained	x	x					JAMSTEC, GNS	
SO255-DR26-8	1. Rock Type: volcanic, complex lava, slighty altered 2. Size: 10x13x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: dense 6. Phenocrysts: Amph, Fsp, Qtz?, Pyrite 7. Matrix: medium grained 9. Encrustations: oxidized rim 10. Comment: check for ZR for possible U-Pb dating	x_air freight box	x		U/Pb on ZR?			JAMSTEC, GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR26-9	1. Rock Type: volcanic, complex lava, slighty altered 2. Size: 9x10x3cm 3. Shape / Angularity: subangular to sub rounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: dense 6. Phenocrysts: Fsp, Pyrite, Qtz, Amph 7. Matrix: medium grained 9. Encrustations: oxidized rim 10. Comment: similar to sample 8, U/Pb dating?	x	x		U/Pb on ZR?			JAMSTEC, GNS	
SO255-DR26-10	1. Rock Type: volcanic, slighty altered 2. Size: 15x11x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to medium grey 5. Texture / Vesicularity: dense 6. Phenocrysts: Fsp, Amph, Qtz 7. Matrix: coarse grained 9. Encrustations: oxidized rim 10. Comment: U/Pb dating?	x_air freight box	x		U/Pb on ZR?			JAMSTEC	
SO255-DR26-11	1. Rock Type: volcanic, altered 2. Size: 12x6x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: dense 6. Phenocrysts: Amph, Fsp, Qtz 7. Matrix: medium grained	x	x		U/Pb on ZR?				
SO255-DR26-12	1. Rock Type: volcanic 2. Size: 14x8x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: medium grey 5. Texture / Vesicularity: dense 6. Phenocrysts: Amph, Fsp, Qtz 7. Matrix: medium grained	x						GNS	
SO255-DR26-13	1. Rock Type: volcanic 2. Size: 14x10x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black to dark grey, light grey rim on one side up to 1.5 cm 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: rim contains xenoliths, black part Fsp, Amph 7. Matrix: fine grained	x	x					GNS	
SO255-DR26-14	1. Rock Type: volcanic, lava with xenoliths 2. Size: 33x22x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to blueish grey 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Fsp, Amph 7. Matrix: fine grained 8. Secondary Minerals: Ol xenocryst maybe from a xenolith; Ol crystals up to 2mm 9. Encrustations: oxidation surface	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR26-15	1. Rock Type: volcanic, lava with xenoliths 2. Size: 15x14x12cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: grey to light grey 5. Texture / Vesicularity: flow structure,20% vesicles 6. Phenocrysts: Amph, Fsp 7. Matrix: fine grained 8. Secondary Minerals: xenolith up to 5mm 9. Encrustations: oxidated surface	x						GNS	
SO255-DR26-16	1. Rock Type: volcanic, lava 2. Size: 19x17x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to dark grey 5. Texture / Vesicularity: 20% vesicles, flow structure 6. Phenocrysts: Fsp, Amph 7. Matrix: fine grained 8. Secondary Minerals: xenoliths up to 6mm 9. Encrustations: oxidated surface parts	x						JAMSTEC, GNS	
SO255-DR26-17	1. Rock Type: volcanic, lava 2. Size: 20x16x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: light to dark grey 5. Texture / Vesicularity: 20% vesicles, flow structure 6. Phenocrysts: Fsp?, Amph? 7. Matrix: fine grained 8. Secondary Minerals: xenoliths up to 5, some Ol in xenoliths; xenocrysts Fsp, Amph? 9. Encrustations: oxidation parts on surface	x						GNS	
SO255-DR26-18	1. Rock Type: volcanic 2. Size: 12x9x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: blueish grey 5. Texture / Vesicularity: 20% vesicles, a few up to 5mm 6. Phenocrysts: Fsp 7. Matrix: medium grained	x_air freight box						GNS	
SO255-DR26-19	1. Rock Type: volcanic 2. Size: 7x7x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey to dark grey 5. Texture / Vesicularity: 20% vesicles, up to 4mm, most located in the lighter part / flow structure 6. Phenocrysts: Ol, Fsp 7. Matrix: medium grained 8. Secondary Minerals: xenoliths up to 9mm 10. Comment: fresh Ol ---> melt inclusiion study?	x							
SO255-DR26-20	1. Rock Type: volcanic, lava flow 2. Size: 7x6x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey black banding 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Plg 3%, Amph 1% 7. Matrix: fine 8. Secondary Minerals: 1% blueish xenolith 10. Comment: flow banding	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR26-21	1. Rock Type: volcanic, lava flow with large xenolith 2. Size: 16x14x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: medium grey 5. Texture / Vesicularity: 15% vesicles 6. Phenocrysts: Amph 10%, Plg 3<% 7. Matrix: fine 8. Secondary Minerals: 3.5x6cm xenolith with 30% fast cooling crystallization textured Fsp	x							
SO255-DR26-22	1. Rock Type: volcanic, lava flow 2. Size: 16x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black, light brown bands 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: Amph? 2% 7. Matrix: fine 8. Secondary Minerals: 1% white xenolith 10. Comment: flow banding, 5cm black brecciated band							GNS	
SO255-DR26-23	1. Rock Type: volcanic, lava flow 2. Size: 16x13x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: black to light grey 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: 2% Plg 7. Matrix: fine 8. Secondary Minerals: 1% white xenolith concentrated in black band								
SO255-DR26-24	1. Rock Type: volcanic, lava 2. Size: 11x12x11cm 3. Shape / Angularity: subangular to angular 4. Color of cut surface: light grey to almost black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Fsp, Amph 7. Matrix: fine grained								
SO255-DR26-25	1. Rock Type: volcanic, slightly altered 2. Size: 6x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey to light grey ---> flow structure 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Fsp, Amph 7. Matrix: fine grained 8. Secondary Minerals: xenolith up to 3mm 9. Encrustations: <1mm Mn crust, some oxidation on surface								
SO255-DR26-26	1. Rock Type: volcanic, slightly altered 2. Size: 6x4x3cm; 5x8x4 cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: 20% 6. Phenocrysts: Amph, Fsp 7. Matrix: fine grained 8. Secondary Minerals: xenolith up to 5cm, Amph, Fsp?								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR26-27	1. Rock Type: volcanic 2. Size: 9x13x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey part with flow structure, black part 5. Texture / Vesicularity: both areas 20% vesicles 6. Phenocrysts:in both areas Amph, Fsp 7. Matrix: fine grained								
SO255-DR26-28	1. Rock Type: volcanic, lava flow, dacite? 2. Size: 11x9x7cm 3. Shape / Angularity: angular 4. Color of cut surface: 7mm black, 25mm black/white speckle 29 mm light brown 5. Texture / Vesicularity: 10% vesicles, <1mm 6. Phenocrysts: Plg?, Qtz?, Hbl?, <1mm 7. Matrix: fine to medium grained							GNS	
SO255-DR26-29	1. Rock Type: volcanic 2. Size: 12x9x6cm 3. Shape / Angularity: angular 4. Color of cut surface: black to medium grey brown 5. Texture / Vesicularity: 10% vesicles, <1mm 6. Phenocrysts: Px? <1mm 7. Matrix: fine grained 9. Encrustations: <1% xenolith blueish								
SO255-DR26-30	1. Rock Type: volcanic 2. Size: 7x6x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: black, brown grey layer 5. Texture / Vesicularity: 7% vesicles, <1mm 6. Phenocrysts: Hbl? <1mm 7. Matrix: fine grained								

Archive Samples DR26 are extra samples and DO NOT CORRESPOND to sample numbers listed above!!!

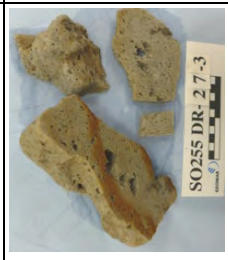
SO255-DR26-1X	1. Rock Type: volcanic 2. Size: 10x6x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey to dark grey 5. Texture / Vesicularity: 20% vesicles, <1mm 6. Phenocrysts: Fsp, Hbl? 7. Matrix: fine grained 8. Secondary Minerals: xenolith up to 8mm								
SO255-DR26-2X	1. Rock Type: volcanic 2. Size: 8x5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: blueish grey 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Fsp 7. Matrix: fine grained								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR26-3X	1. Rock Type: volcanic 2. Size: 9x9x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Fsp, Amph 7. Matrix: fine grained 8. Secondary Minerals: xenolith up to 8mm								
SO255-DR26-4X	1. Rock Type: volcanic 2. Size: 10x9x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: Fsp, Amph 7. Matrix: medium grained								
SO255-DR26-5X	1. Rock Type: volcanic, dacitic? lava 2. Size: 8x6x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 5% vesicles 6. Phenocrysts: Plg, <1mm 7. Matrix: fine grained								
SO255-DR26-6X	1. Rock Type: volcanic, very altered 2. Size: 13x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey, black band 5. Texture / Vesicularity: 10% vesicles, porous 6. Phenocrysts: Px? 7. Matrix: fine grained								
SO255-DR26-7X	1. Rock Type: volcanic 2. Size: 9x8x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: dense 6. Phenocrysts: phyric 7. Matrix: medium grained								
SO255-DR26-8X	1. Rock Type: volcanic 2. Size: 9x6x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black to light brown 5. Texture / Vesicularity: 15% vesicles 6. Phenocrysts: Px, <1mm 7. Matrix: medium grained 9. Encrustations: 4mm xenolith								
SO255-DR26-9X	1. Rock Type: volcanic 2. Size: 6x7x2cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: 5% vesicles 6. Phenocrysts: Hbl 1% 7. Matrix: medium grained 9. Encrustations: 1mm glass								

SO255-DR27

Description of Location and Structure: Havre Trough / Volcanic Front; Kible White Complex, NE-SW trending tectonic feature (rift?) extending from largest cone, upper NW flank

Dredge on bottom UTC 08/03/17 23:38hrs, lat 34 37.41'S, long 179 15.18'E, depth 1930m
Dredge off bottom UTC 09/03/17 00:51hrs, lat 34 37.49'S, long 179 15.66'E, depth 1707m
total volume: 1/3 full
Comments: pumice only, local origin?

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR27-1	1. Rock Type: volcanic, pumice, moderately altered 2. Size: 15x11x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey with some darker parts 5. Texture / Vesicularity: highly porous, 50% vesicularity, ranging from mm up to 1cm 6. Phenocrysts: small black needle shaped minerals, mm sized 7. Matrix: glassy 8. Secondary Minerals: 9. Encrustations: partly thin Mn coating 10. Comment: representative for entire dredge	x						JAMSTEC, GNS	
SO255-DR27-2	1. Rock Type: volcanic, pumice, relatively altered 2. Size: 10x10x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, slightly brownish parts 5. Texture / Vesicularity: highly porous, 50% vesicularity, up to 1cm size 6. Phenocrysts: fine black needle shaped minerals, mm sized 7. Matrix: glassy 8. Secondary Minerals: dark xenolith-particles, up to 2cm within the matrix, partly filled vesicles 9. Encrustations: Mn coating	x							
SO255-DR27-3	1. Rock Type: volcanic, pumice, altered 2. Size: 14x12x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey with brownish parts in it 5. Texture / Vesicularity: highly porous vesicles, 50%, up to several cm 6. Phenocrysts: see -1 7. Matrix: see -1	x							
SO255-DR27-4	1. Rock Type: volcanic, pumice, altered 2. Size: 8x7x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: highly porous in upper part, less in lower part, mm to cm size 6. Phenocrysts: see -1 7. Matrix: see -1 8. Secondary Minerals: xenolith-particles from mm up to 1cm 9. Encrustations: Mn coating 10. Comment: looks like xenoliths accumulated in the middle part	x							

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR27-5	1. Rock Type: volcanic, pumice, strongly altered 2. Size: 15x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey with brownish parts 5. Texture / Vesicularity: see -1 6. Phenocrysts: see -1 7. Matrix: see -1 9. Encrustations: Mn coating on the surface and some of the vesicles	x						JAMSTEC, GNS	
SO255-DR27-6	1. Rock Type: volcanic, pumice, slightly altered 2. Size: 14x10x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: see -1 6. Phenocrysts: see -1 7. Matrix: see -1 8. Secondary Minerals: some vesicles are filled	x							
SO255-DR27-7	1. Rock Type: volcanic, pumice, altered 2. Size: 28x16x14cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: see -1 6. Phenocrysts: black needle shaped minerals up to 0.5mm 7. Matrix: see -1 9. Encrustations: Mn-coating 10. Comment: more black minerals compared to other samples of dredge. Unevenly distributed.	x						JAMSTEC	
SO255-DR27-8	1. Rock Type: volcanic, pumice, altered 2. Size: 9x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey to slightly brownish 5. Texture / Vesicularity: see -1 6. Phenocrysts: see -1 7. Matrix: see -1 8. Secondary Minerals: some vesicles are filled, small xenolith particles up to 0.5mm 9. Encrustations: Mn-coating	x							
SO255-DR27-9	1. Rock Type: volcanic, pumice, altered 2. Size: 19x15x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey to slightly brownish 5. Texture / Vesicularity: see -1 6. Phenocrysts: see -1 7. Matrix: see -1 8. Secondary Minerals: some vesicles are filled with mud 9. Encrustations: Mn-coating	x						JAMSTEC	

SO255-DR28

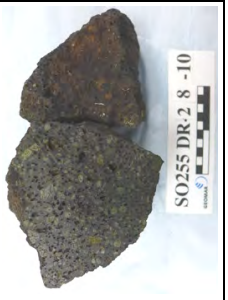
Description of Location and Structure: Havre Trough / Volcanic Front; Kible White Complex, SE medium-sized cone, central section of western flank

Dredge on bottom UTC 09/03/17 03:16hrs, lat 34 40.47'S, long 179 16.75'E, depth 2230m
Dredge off bottom UTC 09/03/17 04:30hrs, lat 34 40.48'S, long 179 17.18'E, depth 1866m
total volume: 1/2 full
Comments: fresh ankaramitic, Ol-Px (Cr-Diopside) phyric pillow lava with abundant fresh glass (-1 to -8)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR28-1	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 20x13x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric many phenocrysts, 25% vesicles, small to large vesicles up to 5mm, mainly round vesicles, some pipe-like vesicles 6. Phenocrysts: 30% overall, small and large, up to 1.5cm, phenocrysts Px (Cr-Diopside) 70%; Ol ~30% 7. Matrix: porphyric - aphyric 8. Secondary Minerals: 9. Encrustations: glassy rim, 1-2cm, phenocrysts within glass, zones of palagonite 10. Comment: samples of DR28 are all very similar and may reflect a single lava flow / eruptive event. Sample assigned to glass rim bearing group, glass rim cut off	x_air freight box			GL			JAMSTEC, GNS	
SO255-DR28-2	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 20x13x11cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: see -1 6. Phenocrysts: 40%, evenly distributed, up to 1.5cm; Px 70%, Ol 30% 7. Matrix: see -1 9. Encrustations: see -1 10. Comment: glass rim bearing group, glass rim cut off	x			GL				
SO255-DR28-3	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 15x11x10cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: many phenocrysts, vesicles 20%, small + large vesicles up to 1cm 6. Phenocrysts: 35%, Px 70%, Ol 30% up to 1cm 7. Matrix: see -1 9. Encrustations: glassy rim (~1cm), phenocrysts within rim 10. Comment: large Px (2cm) in glassy rim, glass rim cut off	x			GL				
SO255-DR28-4	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 16x11x9cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: vesicles 20%, up to 5mm 6. Phenocrysts: 35%, up to 1cm Px 60%, Ol 40% 7. Matrix: see -1 9. Encrustations: glassy rim (~1cm), phenocrysts within rim 10. Comment: glass rim group, glass rim cut off	2x_air freight box			GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR28-5	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 17x11x9cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: see -1 6. Phenocrysts: 35% total overall, up to 1cm Px 35%, Ol 65%. Two different Px types?! green and darker green 7. Matrix: see -1 9. Encrustations: glassy rim (~1cm), phenocrysts within rim, zones of palagonite 10. Comment: glass rim group, glass rim cut off				GL				
SO255-DR28-6	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 9x8x6cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: 25% vesicles up to 1cm 6. Phenocrysts: 35% total overall, up to 5mm Px 70%, Ol 30%. 7. Matrix: see -1 9. Encrustations: see -1 10. Comment: large Ol phenocrysts up to 1.5cm ---> xenolith?! glass rim group, glass rim cut off				GL				
SO255-DR28-7	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 12x10x8cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: 25% vesicles up to 5mm 6. Phenocrysts: 5-10%, up to 8mm Px and Ol. 7. Matrix: see -1 9. Encrustations: glassy rim (~1cm), phenocrysts within rim 10. Comment: less phenocrysts than samples before, glass rim cut off from both sides	x from center_air freight box			GL 2x both sides				
SO255-DR28-8	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 11x9x7cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: 20% vesicles up to 4mm 6. Phenocrysts: 35% total overall, up to 7mm Px 80%, Ol 20%. 7. Matrix: see -1 9. Encrustations: glassy rim (~1cm), phenocrysts within rim 10. Comment: sample just got cut into half				GL				
SO255-DR28-9	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 13x9x6cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: see -8 6. Phenocrysts: 35% total overall, up to 1cm, Px 65%, Ol 35%. 7. Matrix: see -1 9. Encrustations: see -8 10. Comment: sample just got cut into half, very similar to 8							JAMSTEC, GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR28-10	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 19x12x11cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: 40% up to 5mm, few large vesicles up to 1.5cm 6. Phenocrysts: 35% total overall, up to 1cm, Px 70%, Ol 30%, two different Px 7. Matrix: see -1 9. Encrustations: only thin glass marging 10. Comment: two different Px	x						GNS	
SO255-DR28-11	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 11x10x6cm 3. Shape / Angularity: rounded 4. Color of cut surface: see -1 5. Texture / Vesicularity: <10% very small 6. Phenocrysts: 40% total overall, Px 60%, Ol 40% up to 1cm, evenly distributed 7. Matrix: see -1 9. Encrustations: see -10 10. Comment: concentric cooling / spreading cracks	x							
SO255-DR28-12	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 17x11x10cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: 20% up to 1cm, pipe like 6. Phenocrysts: 35% total overall, Px 70% up to 1cm, Ol 30% up to 1cm, evenly distributed, two different pyroxenes 7. Matrix: see -1 9. Encrustations: thin glassy rim 10. Comment: glass rim cut off	x			GL			JAMSTEC, GNS	
SO255-DR28-13	1. Rock Type: see -1 2. Size: 9x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 20%, up to 5mm; porphyric, 30% phenocrysts up to 1cm 6. Phenocrysts: 75% Px (Cr-Diopside) up to 1cm, 25% Ol, up to 5mm 7. Matrix: porphyric - aphyric 9. Encrustations: glassy rim up to 5mm	x			GL				
SO255-DR28-14	1. Rock Type: see -1 2. Size: 12x11x10cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: porphyric, large cracks, 30% vesicles <0.5 to 2-5mm 6. Phenocrysts: 35% phenocrysts; 80% Px (Cr-Diopside) up to 2.5cm, 20% Ol, up to 3mm 10. Comment: large Cr-Diopside, 2.5cm; backup sample	x			GL				

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR28-15	1. Rock Type: see -1 2. Size: 17x11x10cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: porphyric, 40% phenocrysts, up to 1.7cm, 25% vesicles up to 3mm 6. Phenocrysts: Px (Cr-Diopside) 70% up to 1cm (green); Ol 30%, up to 1.7cm; Px (black Augite) <1%, <2mm 7. Matrix: see -1 10. Comment: large Diopside cut at surface? >3cm. Backup sample	x			GL				
SO255-DR28-16	1. Rock Type: see -1 2. Size: 26x23x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, many phenocrysts up to 12 mm, 30% phenocrysts, 20% vesicles <0.1% to 2-5mm 6. Phenocrysts: Px (Cr-Diopside) 75% up to 12mm (green); Ol 25%, up to 5mm; Px (Augite) <1%, <3mm, black 10. Comment: Backup sample	x			GL				
SO255-DR28-17	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 14x12x10cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: porphyric, 5% vesicles, very small 6. Phenocrysts: 20% phenocrysts overall, up to 1cm, Px (80%), Ol (20%), two types of Px 9. Encrustations: only thin glass coating 10. Comment: Backup sample	x						JAMSTEC, GNS	
SO255-DR28-18	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 15x12x8cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: porphyric, 30% vesicles, up to 5mm, rounded and pipe like 6. Phenocrysts: 40% phenocrysts ovrall, up to 1cm, Px (65%), Ol (35%), two types of Px 7. Matrix: see -1 9. Encrustations: only thin glass coating 10. Comment: Backup sample	x						JAMSTEC	
SO255-DR28-19	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 8x7x6cm 3. Shape / Angularity: see -1 4. Color of cut surface: see -1 5. Texture / Vesicularity: porphyric, 30% vesicles, up to 8mm, partly pipe like 6. Phenocrysts: 35% phenocrysts ovrall, Px 60% up to 1.5cm, Ol (40%), two types of Px 9. Encrustations: glassy rim ~5mm 10. Comment: large zoned Px up to 2 cm, this side went to E.Todd							E. Todd	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR28-20	1. Rock Type: volcanic, basalt, pillow lava, uncut piece 2. Size: 16x11x7cm 3. Shape / Angularity: subangular 9. Encrustations: glass rim 10. Comment: GEOMAR representative sample, uncut	x	x		x				
SO255-DR28-21	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 10x7x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, 35% vesicles, <0.1mm 20%, 1-5mm 15% 6. Phenocrysts: Px (Cr-Diopside), 50%, <5mm, Ol 50 % ~5mm 7. Matrix: aphyric, high vesicularity 9. Encrustations: glass rim ~1cm								
SO255-DR28-22	1. Rock Type: see -1 2. Size: 24x21x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, 30% vesicles, <0.1mm 15%, 1-5mm 15% 6. Phenocrysts: Px (Cr-Diopside), <1% up to 3mm 7. Matrix: aphyric, high vesicularity 9. Encrustations: glass rim ~1cm							JAMSTEC	
SO255-DR28-23	1. Rock Type: see -1 2. Size: 10x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, 40% vesicles, <0.1mm 20%, 1-4mm 20%; phenocrysts 10% 6. Phenocrysts: Px (Cr-Diopside), <1% up to 3mm 7. Matrix: aphyric, high vesicularity 9. Encrustations: glass rim ~1cm 10. Comment: TS oversize with glass	x	x		GL				
SO255-DR28-24	1. Rock Type: see -1 2. Size: 8x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, phenocrysts 15% up to 2mm, vesicles 35%, 15% <0.1mm; 20%, 2-5mm 7. Matrix: aphyric, high vesicularity 6. Phenocrysts: Px, Cr-Diopside, 60%, <2mm, Augite 5%, <2mm				GL				

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR28-25 A through G	1. Rock Type: volcanic, basalt, pillow lava flow, pieces of block A, original size 42x27x25 cm 2. Size: A: 15x14x10cm; B: 21x13x11cm; C: 15x13x10cm; D: 15x12x19cm; E: 14 x12x11cm; F: 25x14x15cm; G: 19x15x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 25%, large vesicles up to 1cm (round) 6. Phenocrysts: 40% overall, Px 65%; Ol 35%, two types of Px 7. Matrix: porphyric 9. Encrustations: A to C have glassy rim, B also TS + GC 10. Comment: D-E Backup, G Backup, F TS and GC. B, C, D, E and G not shown	x (B + F)	x (F)		GL (A,B,C)			JAMSTEC, GNS	
SO255-DR28-26A, - B	1. Rock Type: volcanic, basalt, pillow lava flow, pieces of block B, original size 45x28x25 cm 2. Size: A: 26x14x11cm; B: 19x13x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 25% up to 1cm, few very large ones 6. Phenocrysts: 10% overall up to 1cm, Px 65%; Ol 35%, Px larger than Ol 7. Matrix: porphyric 8. Secondary Minerals: 9. Encrustations: glassy rim cut off from A 10. Comment: B is backup sample	x (A)	x (A)		GL (A)				
SO255-DR28-27	1. Rock Type: volcanic, pumice 2. Size: 27x10x8cm 3. Shape / Angularity: rounded 4. Color of cut surface: pale-beige grey 5. Texture / Vesicularity: porous, vesicle (40%) 6. Phenocrysts: needle-like mafic minerals (Px?!) up to 2mm 7. Matrix: glassy porous								
SO255-DR28-28X	1) 19x archive samples GEOMAR, 4x archive samples GNS							GNS	no pic

SO255-DR29

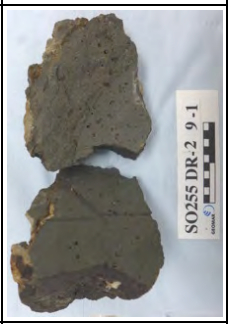
Description of Location and Structure: Havre Trough / Volcanic Front; Kible White Complex, NE cone, mid section of northern flank

Dredge on bottom UTC 09/03/17 06:58hrs, lat 34 34.06'S, long 179 20.31'E, depth 2301m

Dredge off bottom UTC 09/03/17 08:17hrs, lat 34 34.30'S, long 179 20.69'E, depth 1948m

total volume: 1/5

Comments: fresh andesitic lava with variable amounts of Ol-Fsp-Px and fresh glassy rims (- to -9). Sample -12 and -13 contain pyroxenite xenoliths and Ol-Px xenolith respectively. Sample -1 includes contact to dacitic flow. --20 to -23 appear to be more evolved dacite with possible Hbl in places.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR29-1	1. Rock Type: volcanic, andesite lava, 1cm dacite flow in top 2. Size: 31x19x14 cm original size of block A, sample size 14x13x14cm, reserve piece 20x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, 10% vesicles, up to 4mm 6. Phenocrysts: 1% Plg 7. Matrix: medium grained	x_air freight box	x					JAMSTEC, GNS	
SO255-DR29-2	1. Rock Type: volcanic, basaltic andesite 2. Size: 10x8x7cm 3. Shape / Angularity: pillow shape with glass margin 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: 20% vesicles, phyric 6. Phenocrysts: Fsp, Ol, Px 7. Matrix: fine grained 10. Comment: fresh Ol	x_air freight box			GL			JAMSTEC, GNS	
SO255-DR29-3	1. Rock Type: volcanic, basaltic andesite 2. Size: 12x10x4cm 3. Shape / Angularity: subrounded covered entirely by glass, mini pillow 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: 10% vesicles, porphyritic 6. Phenocrysts: Fsp 10%, Ol 5%, Px 10% 7. Matrix: fine grained 9. Encrustations: 2-9mm glass 10. Comment: fresh Ol, pieces are generally to small to cut off glass, TS were taken such that glass rind was included. Polished TS should be made that permit EMP and LA-ICPMS	x			GL				
SO255-DR29-4	1. Rock Type: volcanic, basalt 2. Size: 9x8x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: 7% vesicles, porphyritic 6. Phenocrysts: Plg 5%, up to 3mm, Ol <1% 7. Matrix: fine grained 9. Encrustations: 2-3mm glass 10. Comment: chilled margin	x			GL				
SO255-DR29-5	1. Rock Type: volcanic, basaltic andesite 2. Size: 9x7x5cm 3. Shape / Angularity: round entirely covered by glass, mini pillow 4. Color of cut surface: black 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: Plg 15%, Ol 5%, Px 10% 7. Matrix: fine grained 9. Encrustations: 3mm glass 10. Comment: fresh minerals	x_air freight box			GL				

Appendix 2 (Station Details and Rock Description)

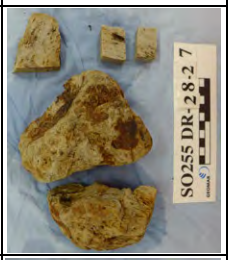
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR29-6	1. Rock Type: volcanic, basaltic andesite 2. Size: 8x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: glomeroporphyritic, 5% vesicles up to 9mm 6. Phenocrysts: Plg / Ol glomerocrysts 3%, Plg <5% 7. Matrix: fine grained 9. Encrustations: 4mm glass 10. Comment: chilled margin	x			GL				
SO255-DR29-7X-1	1. Rock Type: volcanic, basalt, andesite, crystal rich, 4 individual pieces originally taken as back up 2. Size: 10x8x2cm 3. Shape / Angularity: subangular 4. Color of cut surface: darkgrey 5. Texture / Vesicularity: 5% vesicles 6. Phenocrysts: 15% Fsp, 5% Ol, 5-10% Px 7. Matrix: fine - medium grained 9. Encrustations: 5 - 7 glass around entire piece; mini pillow 10. Comment: chilled margin				GL				
SO255-DR29-7X-2	1. Rock Type: volcanic, basalt, andesite, crystal rich, 4 individual pieces originally taken as back up 2. Size: 7x6x5cm 3. Shape / Angularity: subrounded pillow 4. Color of cut surface: darkgrey 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 15% Fsp, 2% Ol, 2% Px 7. Matrix: fine -medium grained 9. Encrustations: covered entirely by 1-2mm glass 10. Comment: fresh minerals				GL				
SO255-DR29-7X-3	1. Rock Type: volcanic, basalt, andesite, crystal rich, 4 individual pieces originally taken as back up 2. Size: 10x7x6cm 3. Shape / Angularity: subrounded pillow with glass margin 4. Color of cut surface: darkgrey 5. Texture / Vesicularity: 15% vesicles 6. Phenocrysts: 15% Fsp, 10% Ol, 5-10% Px 7. Matrix: fine - medium grained 9. Encrustations: 6mm glass rim 10. Comment: fresh minerals				GL				
SO255-DR29-7X-4	1. Rock Type: volcanic, basalt, andesite, crystal rich, 4 individual pieces originally taken as back up 2. Size: 10x7x6cm 3. Shape / Angularity: subangular, pillow with glass margin 4. Color of cut surface: darkgrey 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: 15% Fsp, 10% Ol, 5-10% Px 7. Matrix: fine - medium grained 9. Encrustations: 4mm glass rim 10. Comment: fresh minerals				GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR29-8	1. Rock Type: volcanic, basalt, crystal rich 2. Size: 14x11x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 3% vesicles 6. Phenocrysts: Px 10% 4mm, Ol 5% up to 6mm, Plg 2% 7. Matrix: fine grained 8. Secondary Minerals: <1% xenolithic material	x_air freight box			GL			GNS, JAMSTEC	
SO255-DR29-9	1. Rock Type: volcanic, basalt, more strongly altered 2. Size: 11x8x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: greyish - black 5. Texture / Vesicularity: porphyric, 5% vesicles 6. Phenocrysts: Px 7%, Ol 3%, Plg 2% very altered 7. Matrix: fine grained 8. Secondary Minerals: 1% xenolithic material 10. Comment: fractured	x			GL			GNS, JAMSTEC	
SO255-DR29-10	1. Rock Type: volcanic, basalt 2. Size: 8x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: faded black 5. Texture / Vesicularity: porphyric, 3% vesicles <3mm 6. Phenocrysts: Px 5%, Ol 3%, Plg 2% 7. Matrix: fine grained 8. Secondary Minerals: 1% xenolithic material 10. Comment: fractures cutting across causing alteration of minerals								
SO255-DR29-11	1. Rock Type: volcanic, basalt, andesite 2. Size: 8x8x3cm 3. Shape / Angularity: subrounded, pillow 4. Color of cut surface: darkgrey 5. Texture / Vesicularity: porphyric, 7% vesicles 6. Phenocrysts: Plg 20%, Px 15%, Ol 10% 7. Matrix: medium grained 9. Encrustations: no glass rim 10. Comment: fresh minerals, Px megacrysts								
SO255-DR29-12	1. Rock Type: volcanic, basalt 2. Size: 7x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 1% vesicles 6. Phenocrysts: Px 15% <3mm 7. Matrix: fine grained 8. Secondary Minerals: 4.8 x1cm pyroxenite xenolith								
SO255-DR29-13	1. Rock Type: volcanic, Ol-Px xenolith with andesitic lava attached 2. Size: 6x6x3cm 3. Shape / Angularity: rounded 4. Color of cut surface: dark-green 5. Texture / Vesicularity: attached lava; porphyric, 5% vesicles, xenolith; dense 6. Phenocrysts: host lava; Px 15%, Ol 5%, Plg 5% 7. Matrix: medium grained 9. Encrustations: no glass 10. Comment: fresh minerals in Ol-Px xenolith	x							

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR29-14	1. Rock Type: volcanic, basalt 2. Size: 10x6x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 10% vesicles up to 4mm 6. Phenocrysts: Px 10%, Ol 5%, Plg 1% 7. Matrix: fine grained 10. Comment: fresh minerals								
SO255-DR29-15	1. Rock Type: volcanic, basalt, andesite 2. Size: 7x6x4cm 3. Shape / Angularity: subrounded pillow, porphyric 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 15% vesicles 6. Phenocrysts: Px 5%, Ol 5%, Plg 15% 7. Matrix: medium grained 9. Encrustations: no glass rim 10. Comment: Fsp, Px							GNS, JAMSTEC	
SO255-DR29-16	1. Rock Type: volcanic 2. Size: 6cm diameter 3. Shape / Angularity: rounded 4. Color of cut surface: black 5. Texture / Vesicularity: 12% vesicles, very small 6. Phenocrysts: Px 2%, Ol 1%, Plg 7% 7. Matrix: fine grained 9. Encrustations: glass slab 1mm 10. Comment: fresh minerals								
SO255-DR29-17	1. Rock Type: volcanic, basalt, andesite 2. Size: 8x8x4cm 3. Shape / Angularity: angular, pillow lava, glassy 4. Color of cut surface: black 5. Texture / Vesicularity: 25% vesicles 6. Phenocrysts: Px 3%, Ol 3%, Plg 10% 7. Matrix: fine grained 9. Encrustations: no glass rim 10. Comment: more fine grained than -15								
SO255-DR29-18	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 7x7x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black to dark grey 5. Texture / Vesicularity: porphyric, 20% vesicles 6. Phenocrysts: Px <1%, Ol <1%, Plg 8% 7. Matrix: fine grained								
SO255-DR29-19	1. Rock Type: volcanic, basaltic andesite 2. Size: 7x6x4cm 3. Shape / Angularity: angular, glassy 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, <3% vesicles 6. Phenocrysts: Px 2%, Ol 2%, Plg 10% 7. Matrix: fine grained 9. Encrustations: no glass rim 10. Comment: least phyric							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR29-20	1. Rock Type: volcanic, similar to -1 2. Size: 7x6x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, 15-20% vesicles up to 4mm 6. Phenocrysts: Hbl?! <5%, Fsp <5% 7. Matrix: fine grained								
SO255-DR29-21	1. Rock Type: volcanic, dacite 2. Size: 10x7x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: 15% vesicles 6. Phenocrysts: Px 1%, Fsp 10% 7. Matrix: fine - medium grained	x_air freight box						GNS	
SO255-DR29-22	1. Rock Type: volcanic, dacite? 2. Size: 10x8x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: Fsp <30%, mafic minerals Px or Amph 7. Matrix: medium to coarse grained 10. Comment: Fsp phyric?	x_air freight box							
SO255-DR29-23	1. Rock Type: volcanic, dacite 2. Size: 8x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: 1% vesicles 6. Phenocrysts: Fsp 15%, Px 5-10% 7. Matrix: medium grained							GNS	
SO255-DR29-24	1. Rock Type: volcanic, pumice 2. Size: 10x9x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: 15% vesicles, porous 6. Phenocrysts: Amph 1% 7. Matrix: fine grained, glassy, porous								
SO255-DR29-25	1. Rock Type: volcanic, dacite - rhyolite 2. Size: 13x8x6cm 3. Shape / Angularity: subrounded pumice 4. Color of cut surface: white, yellowish white 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Hbl 1-5%, Qtz 1%, Fsp 5% 7. Matrix: fine grained								
SO255-DR29-26	1. Rock Type: volcanic, pumice 2. Size: 16x12x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: 20% vesicles, porous 6. Phenocrysts: Hbl 1%, Qtz 1% 7. Matrix: fine grained, glassy, porous							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR29-27	1. Rock Type: volcanic, dacite - rhyolite 2. Size: 18x9x6cm 3. Shape / Angularity: rounded pumice 4. Color of cut surface: white, dark white 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Hbl 2%, Qtz 1%, Fsp <5% 7. Matrix: fine - medium grained							GNS	
SO255-DR29-28	1. Rock Type: volcanic, pumice 2. Size: 13x5x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: 30% vesicles, porous 6. Phenocrysts: Hbl 1%, Qtz 1% 7. Matrix: fine grained, glassy, porous								
SO255-DR29-29	1. Rock Type: volcanic, pumice 2. Size: 14x7x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: 20% vesicles, porous 6. Phenocrysts: Hbl 1%, Qtz 1% 7. Matrix: fine grained, glassy, porous								
SO255-DR29-30	1. Rock Type: volcanic, dacite 2. Size: 7x6x6cm 3. Shape / Angularity: rounded pumice 4. Color of cut surface: brown yellowish brown 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: Hbl/Px? 5%, Fsp >30% 7. Matrix: coarse grained 10. Comment: differ from other white pumice							GNS	

SO255-DR30

Description of Location and Structure: Kermadec Ridge, western flank. NW facing cliff in mid-section of Kermadec Ridge above 3300 oval shaped basin

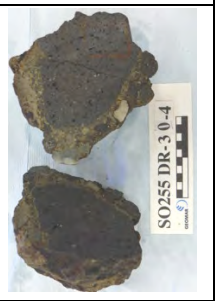
Dredge on bottom UTC 09/03/17 10:02hrs, lat 34 32.79'S, long 179 28.85'E, depth 2235m

Dredge off bottom UTC 09/03/17 12:11hrs, lat 34 33.05'S, long 179 29,22'E, depth 1720m

total volume: 1/4 full

Comments: slightly altered Fsp phyric lava fragments dominates (-1 to -6). Volcaniclastics -7 to -14, sediment -14 & -15

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR30-1	1. Rock Type: volcanic, slightly altered 2. Size: 14x12x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: phyric, 10-15% vesicles 6. Phenocrysts: <1% Olivine, 20% feldspar 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled 9. Encrustations: < 1mm Mn crust	x_air freight box	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR30-2	1. Rock Type: volcanic 2. Size: 25x10x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 25-30% vesicles, phyric 6. Phenocrysts: 15% feldspar up to 7mm, <10% Px 7. Matrix: fine grained 8. Secondary Minerals: Xenoliths	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR30-3A	1. Rock Type: volcanic, slightly altered 2. Size: 8x6x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: 20-25% vesicles, porphyritic 6. Phenocrysts: Fsp 15%, Px <10%, some altered minerals (Ol?) 7. Matrix: fine grained 9. Encrustations: <1 mm Mn crust 10. Comment: picture shows A, B and C	x_air freight box	x					GNS	
SO255-DR30-3B	1. Rock Type: volcanic, slightly altered 2. Size: 7x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: 20% vesicles, porphyritic 6. Phenocrysts: feldspar 10%, 15% Px 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: picture shows A, B and C								
SO255-DR30-3C	1. Rock Type: volcanic, slightly altered 2. Size: 9x9x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: feldspar 15-20%, Px <15% 7. Matrix: fine grained 9. Encrustations: < 1mm Mn crust 10. Comment: picture shows A, B and C								
SO255-DR30-4	1. Rock Type: volcanic, slightly altered 2. Size: 17x10x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, 20% 6. Phenocrysts: Px 20%, Feldspar 15% 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust, 2 cm rim volcaniclastic	x_air freight box	x				GC in air-freight box		
SO255-DR30-5A	1. Rock Type: volcanic 2. Size: 13x9x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, 25% vesicles 6. Phenocrysts: feldspar 20%, Px 10% 7. Matrix: fine grained 9. Encrustations: < 1mm Mn crust 10. Comment: chilled margin, picture shows A, B and C	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR30-5B	1. Rock Type: volcanic, slightly altered 2. Size: 13x7x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles, most small some up to 1cm, porphyritic 6. Phenocrysts: Feldspar 15% 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust,up to 7 cm rim volcaniclastic 10. Comment: picture shows A, B and C								
SO255-DR30-5C	1. Rock Type: volcanic 2. Size: 9x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 40% vesicles 6. Phenocrysts: feldspar 15% 7. Matrix: fine grained 9. Encrustations: < 1mm Mn crust, up to 4cm volcaniclastic 10. Comment: picture shows A, B and C								
SO255-DR30-6	1. Rock Type: volcanic, slightly altered 2. Size: 10x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 6. Phenocrysts: feldspar 30%, Ol <5%, glass 7. Matrix: coarse grained							GNS	
SO255-DR30-7	1. Rock Type: volcaniclastic 2. Size: 24x16x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black, brownish, beige 5. Texture / Vesicularity: layered, sorted, medium to fine grained 9. Encrustations: 5 cm rim of beige, fine grained material							GNS	
SO255-DR30-8	1. Rock Type: volcaniclastic, similar to 7 2. Size: 21x13x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black, brownish, beige, red 5. Texture / Vesicularity: layered, sorted, medium to fine grained 9. Encrustations: 2.5 cm rim of black medium grained material, 4 cm rim of beige/brownish fine grained, dense material							GNS	
SO255-DR30-9	1. Rock Type: volcaniclastic, similar to 7 & 8 2. Size: 27x13x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black, brownish, beige 5. Texture / Vesicularity: layered, sorted, medium to fine grained 9. Encrustations: 1.on top 8 cm of brownish, fine grained material. 2. 17cm black sorted layered medium to fine grained material. 3. on bottom 0.5 cm of brownish, fine grained material								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR30-10	1. Rock Type: volcaniclastic, similar to 7,8 &9 2. Size: 22x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: similar to 9 5. Texture / Vesicularity: layered, sorted, medium to fine grained 9. Encrustations: 4 layers of beige material (fine grained), 3 layers of black material (medium grained)							GNS	
SO255-DR30-11	1. Rock Type: volcaniclastic 2. Size: 30x21x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish, black 5. Texture / Vesicularity: unsorted, medium grained, no vesicles								
SO255-DR30-12A	1. Rock Type: volcaniclastic 2. Size: 12x5x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish, black, beige 5. Texture / Vesicularity: unsorted, medium to coarse grained, no vesicles 10. Comment: picture shows A, B and C								
SO255-DR30-12B	1. Rock Type: volcaniclastic, slightly altered 2. Size: 10x7x7cm 3. Shape / Angularity:subrounded 4. Color of cut surface: brownish, black 5. Texture / Vesicularity: fine grained, no vesicles, unsorted 10. Comment: picture shows A, B and C								
SO255-DR30-12C	1. Rock Type: volcaniclastic, slightly altered 2. Size: 12x9x7cm 3. Shape / Angularity:similar to 12A 4. Color of cut surface:similar to 12A 5. Texture / Vesicularity: similar to 12A 10. Comment: picture shows A, B and C								
SO255-DR30-13	1. Rock Type: volcaniclastic, slightly altered 2. Size: 8x7x5cm 3. Shape / Angularity:subrounded 4. Color of cut surface:brownish, black, light grey 5. Texture / Vesicularity: no vesicles, clasts up to 2.5cm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR30-14	1. Rock Type: cross-bedding sediment, slightly altered 2. Size: 14x11x9cm 3. Shape / Angularity:subrounded 4. Color of cut surface:beige 5. Texture / Vesicularity: no vesicles,layered, fine to medium grained, mudstone to stllstone 7. Matrix: fine grained 10. Comment: turbidite?								
SO255-DR30-15	1. Rock Type: similar to 14 2. Size: 21x20x6cm 3. Shape / Angularity:subangular 4. Color of cut surface:beige, brown, black 5. Texture / Vesicularity: no vesicles,layered, fine grained 7. Matrix: fine grained							GNS	

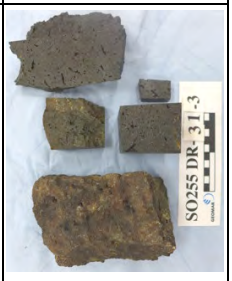
SO255-DR31

Description of Location and Structure: Kermadec Ridge, Western flank, SW facing cliff in lower-section of Kermadec Ridge at the northern termination of an oval shaped basin

Dredge on bottom UTC 09/03/17 14:30hrs, lat 34 29.20'S, long 179 28.89'E, depth 2670m
Dredge off bottom UTC 09/03/17 15:44hrs, lat 34 29.00'S, long 179 29,24'E, depth 2330m
total volume: 1/4 full
Comments: fairly fresh andesitic lava with abundant Fsp phenocrysts, much less Px and occasional Ol

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR31-1	1. Rock Type: volcanic, basaltic andesite, fresh 2. Size: 35x17x25cm original size of block E, sample size 20x14x12cm, back up 12x13x14cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: 3%, up to 1mm, open, only few are filled 6. Phenocrysts: Fsp 25%, <4mm; Cpx 10% <2mm, few Ol 7. Matrix: porphyric, dense, some vesicles 8. Secondary Minerals: vesicles filled 10. Comment: fresh material, small Px (<1mm) within Fsp, fresh phenocrysts	x_air freight box	x	2			GC in air-freight box	GNS	
SO255-DR31-2	1. Rock Type: volcanic, basaltic andesite, fresh 2. Size: 19x11x22cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: 2% vesicles, <2mm, open, some larger up to 6mm 6. Phenocrysts: Fsp 25%, <4mm; Cpx 10% <2mm 7. Matrix: porphyric, dense, some vesicles 8. Secondary Minerals: vesicles filled 10. Comment: fresh material, small Px (<1mm) within Fsp, fresh phenocrysts, similar to -1	x_air freight box	x	2				GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR31-3	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 20x30x36cm original block B, sample 15x12x14cm, Backup A: 22x15x12cm, Backup B: 22x20x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 10% vesicles, <5mm, open, partly pipe like 6. Phenocrysts: Fsp 10%, <3mm; Px 10% <4mm, altered Ol ~1mm 7. Matrix: porphyric, medium vesicularity 8. Secondary Minerals: iddingsite replacing Ol 10. Comment: fresh phenocrysts, except Ol	x_air freight box	x	2			GC in air-freight box	GNS	
SO255-DR31-4	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 15x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 10% vesicles, <7mm, open 6. Phenocrysts: Px 15%, <5mm; Fsp 15% <3mm, few altered Ol 7. Matrix: porphyric, medium vesicularity 8. Secondary Minerals: altered Ol 10. Comment: fresh phenocrysts, except Ol; similar to -3	x_air freight box	x						
SO255-DR31-5	1. Rock Type: volcanic, basaltic andesite, altered 2. Size: 18x15x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 25% vesicles, <5mm, open, partly filled with brownish material 6. Phenocrysts: Fsp 5%, <2mm; Px 8% <4mm, altered Ol <1%, <1mm 7. Matrix: porphyric, high vesicularity 8. Secondary Minerals: altered Ol 10. Comment: some fresh Fsp?!	x_air freight box	x	2				GNS	
SO255-DR31-6	1. Rock Type: volcanic, basaltic andesite, altered 2. Size: 18x9x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 10% vesicles, <5mm, small and larger vesicles, open, few filled with CC? 6. Phenocrysts: Fsp 5%, <2mm; Px 3% <2mm 7. Matrix: porphyric, aphanitic, medium-high vesicularity 8. Secondary Minerals: altered Ol 10. Comment: fresh dark green Px, slightly altered Fsp	x_air freight box	x	3-4				GNS	
SO255-DR31-7	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 12x8x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: 15% vesicles, <5mm, open 6. Phenocrysts: Fsp 20%, <3mm; Px 15% <2mm, some Ol <1%, ~1mm) 7. Matrix: porphyric, medium-high vesicularity 8. Secondary Minerals: altered Ol 10. Comment: similar to -6 but fresher Ol	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR31-8	1. Rock Type: volcaniclastic, andesitic clasts 2. Size: 31x22x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: green matrix, clasts grey 5. Texture / Vesicularity: 8% vesicles, <3mm, open in clasts 6. Phenocrysts: Fsp 30%, <6mm; slightly altered 7. Matrix: brecciated, clasts: porphyric 8. Secondary Minerals: altered Ol 10. Comment: brecciated lava flow with andesitic clasts, many Fsp phenocrysts	x of clast_air freight box		2-3				GNS	
SO255-DR31-9	1. Rock Type: volcaniclastic, volcanic clasts (basaltic andesite) 2. Size: 14x8x19cm 3. Shape / Angularity: subrounded 4. Color of cut surface: matrix green, clast grey 5. Texture / Vesicularity: in clasts 20% vesicles, <1cm, large, open 6. Phenocrysts: Fsp 25%, <4mm; Px ?% <4mm, Ol <1% weathered) 7. Matrix: brecciated, clasts porphyric 10. Comment: similar to -8, clasts more mafic /basic than in -8	missing!	x	2-3					
SO255-DR31-10X	1. Rock Type: volcanic, andesite 2. Size: A:15x12x4cm, B:11x7x4cm, C:11x10x6cm, D:8x7x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: 3% vesicles, <2mm, open 6. Phenocrysts: Fsp 25%, <3mm; Px 10% <2mm 7. Matrix: porphyric, dense, some vesicles 10. Comment: similar to -1, -2, no X label shown in picture			2-4					
SO255-DR31-11X	1. Rock Type: volcanic, basaltic andesite, fresh 2. Size: 10x6x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to dark grey 5. Texture / Vesicularity: 20% vesicles, <5mm, open 6. Phenocrysts: Fsp 15%, <3mm; Px 15% <2mm; Ol 3%, <1mm 7. Matrix: porphyric, medium vesicularity 8. Secondary Minerals: altered Ol 10. Comment: similar to -3, -4, fresh Fsp; archive sample, no X label shown in picture	x_air freight box		2					
SO255-DR31-12X	1. Rock Type: volcanic, basalt - basaltic andesite, slightly altered 2. Size: 9x8x5cm 3. Shape / Angularity: rounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 20% vesicles, <4mm, open 6. Phenocrysts: Fsp 15%, <4mm; Px 15% <3mm; Ol 5%, ~1mm 7. Matrix: porphyric 8. Secondary Minerals: altered Ol 10. Comment: fresh phenocrysts except Ol, no X label	x_air freight box		2					

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR31-13X	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 8x6x7cm 3. Shape / Angularity: rounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 20% vesicles, <7mm, open 6. Phenocrysts: Fsp 20%, <5mm; Px 15% <4mm; Ol 3%, ~2mm 7. Matrix: porphyric 8. Secondary Minerals: altered Ol 10. Comment: similar to -12, fresh phenocrysts except Ol, no X label shown in picture	x_air freight box		2					

SO255-DR32

Description of Location and Structure: Kermadec Ridge, Western flank, NW facing scarp above SW-NE striking oval shaped basin, track from base to mid-section along steepest part.

Dredge on bottom UTC 09/03/17 19:11hrs, lat 34 15.16'S, long 179 30.36'E, depth 2990m

Dredge off bottom UTC 09/03/17 20:31hrs, lat 34 15.39'S, long 179 30,69'E, depth 2537m

total volume: 1/4 full

Comments: Two petrographic units identifies 1) Px dominated phyric andesite -1 to -6 and Fsp dominated phyric andesite -7 to -15X.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR32-1	1. Rock Type: volcanic, basalt, fresh 2. Size: 35x25x22cm original size of block B 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 20%, <1cm, open 6. Phenocrysts: Px 25%, <3mm; Fsp 15% <3mm, Ol 1%, 1mm 7. Matrix: porphyric, medium-high vesicularity 8. Secondary Minerals: altered Ol 10. Comment: fresh phenocrysts, except Ol	x_air freight box	x	2			GC in air-freight box	GNS	
SO255-DR32-2	1. Rock Type: volcanic, basalt, slightly altered but overall fairly fresh 2. Size: 13x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 25%, <1.5cm, large, open 6. Phenocrysts: Px 15%, <3mm, two types?; Fsp 10% <2mm, Ol 1%, ~1mm 7. Matrix: porphyric, high vesicularity 10. Comment: fresh phenocrysts, similar to -1	x_air freight box	x	2				GNS	
SO255-DR32-3	1. Rock Type: volcanic, basalt, fresh 2. Size: 10x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 25%, <5mm, open 6. Phenocrysts: Px 20%, <4mm; Fsp 15% <2mm, Ol 1%, ~1mm 7. Matrix: porphyric, high vesicularity 10. Comment: fresh phenocrysts, similar to -1 & -2 but without Ol	x_air freight box	x	2				GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR32-4	1. Rock Type: volcanic, basaltic, fresh 2. Size: 15x9x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 20%, <3mm, open 6. Phenocrysts: Px 20%, <4mm, two types?; Fsp 15% <2mm, Ol 1%, ~1mm 7. Matrix: porphyric, medium vesicularity 10. Comment: fresh phenocrysts, similar to -1 & -2 but without Ol	x_air freight box	x	2				GNS	
SO255-DR32-5	1. Rock Type: volcanic, basaltic, fresh 2. Size: 10x9x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 20%, <5mm, open 6. Phenocrysts: Px 15%, <3mm, Fsp 15% <2mm, Ol 1%, ~2mm 7. Matrix: porphyric, medium vesicularity 10. Comment: similar to -1, -2 and -4 -2	x_air freight box		2					
SO255-DR32-6	1. Rock Type: volcanic, basaltic, fresh 2. Size: 12x9x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 25%, <5mm, open 6. Phenocrysts: Px 15%, <4mm, Fsp 15% <3mm, Ol 1%, <1mm 7. Matrix: porphyric, medium vesicularity 10. Comment: similar to -1, -2, -4 and -5	x_air freight box		2					
SO255-DR32-7A, B	1. Rock Type: volcanic, altered 2. Size: 52x40x28cm original size of block E. Two pieces were taken and labelled A (to GEOMAR) & B (to GNS) 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 30%, <5mm, some large >1cm, open 6. Phenocrysts: Fsp 25%, <4mm, Px 10% <4mm, Ol 1%, <2mm 7. Matrix: porphyric, high vesicularity 9. Encrustations: thin glass rim? 10. Comment: more porous , altered than prev. samples, Fsp slightly weathered	x of -A_air freight box		3-4				GNS	
SO255-DR32-8	1. Rock Type: volcanic, fresh andesite 2. Size: 11x9x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: 5%, <2mm, open 6. Phenocrysts: Fsp 25%, <2mm, Px within Fsp, few Ol <1%, <1mm 7. Matrix: porphyric, low vesicularity 10. Comment: fresh material, fresh Fsp, Px encolsed in Fsp	x_air freight box	x	2			GC in air-freight box	GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR32-9	1. Rock Type: volcanic, fresh andesite 2. Size: 9x7x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: <5%, <2mm, open 6. Phenocrysts: Fsp 25%, <2mm, Px 5%, <2mm, mainly within Fsp 7. Matrix: porphyric, low vesicularity 10. Comment: fresh material, fresh phenocrysts Px within Fsp	x_air freight box		2					
SO255-DR32-10	1. Rock Type: volcanic, fresh andesite 2. Size: 9x7x4cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: <1%, <2mm 6. Phenocrysts: Fsp 20%, <4mm 7. Matrix: porphyric, dense	x_air freight box		1-2					
SO255-DR32-11	1. Rock Type: volcanic, fresh andesite 2. Size: 10x8x4cm 3. Shape / Angularity: angular 4. Color of cut surface: grey - light grey 5. Texture / Vesicularity: <5%, 2mm, open 6. Phenocrysts: Fsp 25%, <3mm, fresh 7. Matrix: porphyric 10. Comment: fresh material, fresh Fsp --> good for dating	x_air freight box		1					
SO255-DR32-12	1. Rock Type: volcanic, fresh, slightly altered andesite 2. Size: 12x10x9cm 3. Shape / Angularity: angular 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: <1%, <1mm, open 6. Phenocrysts: Fsp 25%, <5mm; Px <5%, <3mm, Ol 1% <2mm 7. Matrix: porphyric 8. Secondary Minerals: weathered Px & Ol 10. Comment: fresh Fsp, weathered / altered Px + Ol --> brownish weathered material	x_air freight box	x	2				GNS	
SO255-DR32-13	1. Rock Type: volcanic, fresh, slightly altered andesite 2. Size: 10x7x7cm 3. Shape / Angularity: angular 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: <1%, <1mm, open 6. Phenocrysts: Fsp 30%, <5mm; few Px <1%, <3mm, Ol 1% <2mm 7. Matrix: porphyric, dense 10. Comment: similar to -12, brownish weathered material	x_air freight box		2					

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR32-14	1. Rock Type: volcaniclastic, altered basaltic clasts 2. Size: 14x10x8cm 3. Shape / Angularity: rounded 4. Color of cut surface: matric green, clasts: dark grey 5. Texture / Vesicularity: in clasts <1%, <1mm, open 6. Phenocrysts: in clasts Fsp <10%, <2mm; few Px <5%, <2mm, Ol 1% <2mm, phenocryst fragments in matrix visible 7. Matrix: brecciated, weathered, clasts: porphyric 10. Comment: porous, brecciated material								
SO255-DR32-15X	1. Rock Type: volcanic, basaltic, fresh, two pieces taken 2. Size: 13x11x9cm and 11x10x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: 35%, <8mm 6. Phenocrysts: Px <25%, <4mm; Fsp <20%, <4mm, Ol 1% <2mm, phenocryst fragments in matrix visible 7. Matrix: porphyric 10. Comment: fresh phenocrysts incl Ol. No X label shown in picture			2					

SO255-DR33

Description of Location and Structure: Kermadec Ridge, Western flank, small cone, south facing slope

Dredge on bottom UTC 09/03/17 19:11hrs, lat 34 15.16'S, long 179 30.36'E, depth 2990m

Dredge off bottom UTC 10/03/17 00:37hrs, lat 34 18.97'S, long 179 32,25'E, depth 2092m

total volume: empty

Comments:

SO255-DR34

Description of Location and Structure: Kermadec Ridge, Western flank, repetition of DR33 at small cone, 450m NW of DR33

Dredge on bottom UTC 10/03/17 02:30hrs, lat 34 19.05'S, long 179 31.89'E, depth 2290m

Dredge off bottom UTC 10/03/17 03:40hrs, lat 34 18.77'S, long 179 32,21'E, depth 1968m

total volume: empty

SO255-DR35

Description of Location and Structure: Kermadec Ridge, upper section of western flank

Dredge on bottom UTC 10/03/17 05:53hrs, lat 34 20.70'S, long 179 36.46'E, depth 1739m

Dredge off bottom UTC 10/03/17 07:45hrs, lat 34 20.51'S, long 179 36,61'E, depth 1459m

total volume: 2/3 full

Comments: Sample -1 to -7 highly Fsp phyric andesite, -5 with strongly reddish oxidized groundmass. -8 through -9 more strongly alered Px pyric lava, -10 & -11 are volcaniclastic with some containing larger clasts good for geochemistry.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR35-1	1. Rock Type: volcanic, andesite, fresh 2. Size: 24x17x19cm original size of block E, sample 17x14x13cm, back up 20x17x16 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, <1% vesicles 6. Phenocrysts: Plg 20%, <2mm; slightly weathered, Kfs?? 15% <2mm, weathered 7. Matrix: fine grained, larger phenocrysts 8. Secondary Minerals: brecciated rim 10. Comment: sample bag with GC and remaining sample not found when packing air freight box! Check blue boxes again!	x_air freight box	x	2-3			not found when packing air freight box	GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR35-2	1. Rock Type: volcanic, andesite, fresh 2. Size: 18x16x12cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, <1% vesicles 6. Phenocrysts: Plg 20%, <2mm; slightly weathered, Kfs?? 15% <3mm, weathered, Px ~2% <2mm, fresh 7. Matrix: fine grained, larger phenocrysts 10. Comment: similar to -1	x_air freight box	x	2-3			GC in air-freight box		
SO255-DR35-3	1. Rock Type: volcanic, basaltic andesite, fresh 2. Size: 11x8x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, <1% vesicles 6. Phenocrysts: Plg 25%, <3mm; rather fresh, Px ~2% <1mm, fresh, Ol 3% <2mm iddingsite 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 10. Comment: aligned alteration	x_air freight box	x	3					
SO255-DR35-4	1. Rock Type: volcanic, andesite, fresh 2. Size: 13x11x9cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, <1% vesicles 6. Phenocrysts: Fsp 25%, <3mm; strong weathering, Px ~2% <1mm, fresh 7. Matrix: fine grained 8. Secondary Minerals: possibly iddingsite , dark red mineral, strong weathering	x_air freight box	x	3					
SO255-DR35-5	1. Rock Type: volcanic, parallel flow texture, strong oxidation Fe staining along flow texture 2. Size: 19x15x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown - grey, ayered 5. Texture / Vesicularity: porphyric, flow texture, <1% vesicles 6. Phenocrysts: Fsp with enclosed Px 20%, <3mm; strong weathering 7. Matrix: fine grained 8. Secondary Minerals: strongly reddish oxidized layers	x_air freight box	x	4				GNS	
SO255-DR35-6	1. Rock Type: volcanic, andesite, light flow texture 2. Size: 19x15x10cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, <1% vesicles 6. Phenocrysts: Fsp 25%, <3mm fresh 7. Matrix: fine grained 8. Secondary Minerals: red dots, Fe-hydroxide	x_air freight box		3-4					
SO255-DR35-7	1. Rock Type: volcanic, andesite, slightly brecciated 2. Size: 11x8x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, <1% vesicles 6. Phenocrysts: Fsp 25%, <3mm strong weathering; Px 3%, <2mm, fresh 7. Matrix: fine grained 8. Secondary Minerals: red dots, Fe-hydroxide 10. Comment: fractured, possibly brecciated, cracks filled with Qtz?	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR35-8	1. Rock Type: volcanic, andesite, strong weathering 2. Size: 14x9x7cm 3. Shape / Angularity: angular 4. Color of cut surface: brown - grey 5. Texture / Vesicularity: porphyric, <1% vesicles 6. Phenocrysts: Fsp 3%, <1mm strong weathering; Px 3%, <1mm, fresh 7. Matrix: fine grained 8. Secondary Minerals: iron oxide on Mn in cracks 10. Comment: thin Mn coating	x_air freight box	x	4					
SO255-DR35-9	1. Rock Type: volcanic, andesite, strongly weathered 2. Size: 24x13x8cm 3. Shape / Angularity: angular 4. Color of cut surface: grey - brown 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px 10%, <3mm weathered; Fsp 5%, <2mm strongly weathered 7. Matrix: fine grained 8. Secondary Minerals: Mn in cracks, groundmass brown-greenish 10. Comment: thin Mn coating	x_air freight box		4				GNS	
SO255-DR35-10	1. Rock Type: volcanic, recovered clast from breccia 2. Size: 13x8x8cm 3. Shape / Angularity: angular 4. Color of cut surface: grey clast, green breccia matrix 5. Texture / Vesicularity: clast, porphyric; matrix, brecciated 6. Phenocrysts: clast, Fsp 25%, <4mm partially altered toward rim; Px 10%, <2mm strongly weathered 7. Matrix: fine grained in breccia, fine grained clast 9. Encrustations: thin Mn coating 10. Comment: cut shows large clast	x_air freight box		3					
SO255-DR35-11	1. Rock Type: breccia 2. Size: 17x13x9cm 3. Shape / Angularity: angular 4. Color of cut surface: breccia matrix-grey-green-brown 5. Texture / Vesicularity: brecciated 7. Matrix: brecciated 9. Encrustations: thin Mn coating 10. Comment: large angular volcanic clas embedded in matrix	x						GNS	
SO255-DR35-12	1. Rock Type: volcanic, strongly altered 2. Size: 11x11x9cm 3. Shape / Angularity: angular 4. Color of cut surface: grey-green 5. Texture / Vesicularity: porphyric <1%, vesicles 10% up to 1cm, filled with Fe hydroxide 6. Phenocrysts: Px 10% <2mm, Fsp 15-20% <3mm either rounded , idiomorph fresh and / or altered factured 7. Matrix: fine grained 8. Secondary Minerals: Fe hydroxide, CC? in vesicles 9. Encrustations: thin Mn coating 10. Comment: not clear if regular breccia or volcanically derived breccia, could be slightly metamorphic	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR35-13	1. Rock Type: sediment, breccia 2. Size: 15x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown, clasts have colours 5. Texture / Vesicularity: mm to cm sized clasts in a fine grained matrix 7. Matrix: fine grained 10. Comment: clasts partly very well rounded	x							
SO255-DR35-14	1. Rock Type: volcanic? 2. Size: 13x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey brownish 5. Texture / Vesicularity: porphyric 6. Phenocrysts: very altered minerals, maybe Plg up to 1mm 7. Matrix: fine grained 8. Secondary Minerals: altered Ol with reddish color 9. Encrustations: thin Mn coating 10. Comment: difficult to decide if volcanic or sedimentary	x							
SO255-DR35-15	1. Rock Type: sediment, breccia 2. Size: 12x11x8cm 3. Shape / Angularity: angular 4. Color of cut surface: variable colors from brown to green 5. Texture / Vesicularity: many clasts with variable shape up to 1cm 7. Matrix: very fine grained 8. Secondary Minerals: altered Ol with reddish color 9. Encrustations: thin Mn coating 10. Comment: contains more clasts than -13	x							
SO255-DR35-16	1. Rock Type: volcanic 2. Size: 13x11x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown 5. Texture / Vesicularity: very small minerals in a very altered matrix 6. Phenocrysts: Fsp 10% up to 2mm; Cpx 10% up to 2mm, slightly altered 7. Matrix: fine grained, very altered 8. Secondary Minerals: in the matrix and along cracks 9. Encrustations: thin Mn coating	x							

SO255-DR36

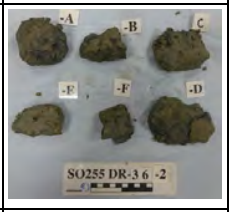
Description of Location and Structure: Kermadec Fore Arc, near trench

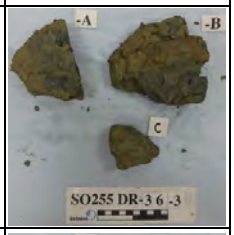
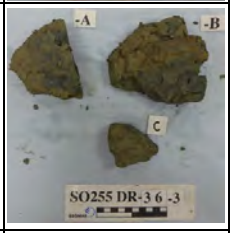
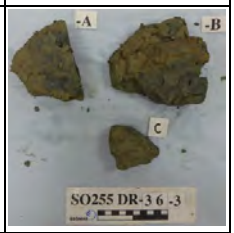
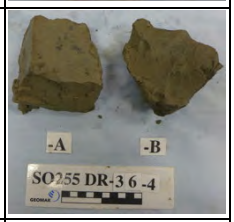
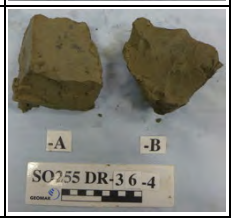
Dredge on bottom UTC 10/03/17 19:58hrs, lat 35 38.09'S, long 178 56.42'W, depth 6859m

Dredge off bottom UTC 10/03/17 21:07hrs, lat 35 37.79'S, long 178 56,26'W, depth 6564m

total volume: few mud stones

Comments: mud stones, no igneous material

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR36-1	1. Rock Type: sediment, silt - mud stone 2. Size: 14x11x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: greyish green, in parts dark grey 5. Texture / Vesicularity: slightly layered 7. Matrix: silt size grains 10. Comment: soft sediment							GNS	
SO255-DR36-2A	1. Rock Type: sediment, silt - mud stone 2. Size: 6x7x5cm 3. Shape / Angularity: rounded 4. Color of cut surface: grey, dark grey 7. Matrix: silt size grains 10. Comment: soft sediment								
SO255-DR36-2B	1. Rock Type: sediment, silt - mud stone 2. Size: 7x5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, dark grey 7. Matrix: silt size grains 10. Comment: soft sediment								
SO255-DR36-2C	1. Rock Type: sediment, silt - mud stone 2. Size: 8x5x4cm 3. Shape / Angularity: subrounded - rounded 4. Color of cut surface: grey, dark grey 7. Matrix: silt size grains 10. Comment: soft sediment								
SO255-DR36-2D	1. Rock Type: sediment, silt - mud stone 2. Size: 10x6x3cm 3. Shape / Angularity: plane, like a plate 4. Color of cut surface: dark grey, greyish green 7. Matrix: silt size grains 10. Comment: soft sediment								
SO255-DR36-2E	1. Rock Type: sediment, silt - mud grain 2. Size: 7x5x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, greyish green 7. Matrix: silt size grains 10. Comment: soft sediment								
SO255-DR36-2F	1. Rock Type: sediment, silt - mud stone 2. Size: 6x5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: slightly layered 7. Matrix: silt size grains 10. Comment: soft sediment								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR36-3A	1. Rock Type: sediment, silt - mud stone 2. Size: 11x8x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey - greyish green 7. Matrix: silt size grains 10. Comment: soft sediment								
SO255-DR36-3B	1. Rock Type: sediment, silt - mud stone 2. Size: 11x11x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey - greyish yellow 7. Matrix: silt size grains 10. Comment: soft sediment								
SO255-DR36-3C	1. Rock Type: sediment, silt - mud stone 2. Size: 8x5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 7. Matrix: silt size grains 10. Comment: soft sediment								
SO255-DR36-4A	1. Rock Type: sediment, silt - mud stone 2. Size: 11x10x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: greyish yellow 7. Matrix: silt size grains 10. Comment: soft sediment								
SO255-DR36-4B	1. Rock Type: sediment, silt - mud stone 2. Size: 11x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: greyish green 7. Matrix: silt size grains 10. Comment: soft sediment								

SO255-DR37

Description of Location and Structure: Kermadec Fore Arc, southern section; S-slope of small "noose" in the lower section of the

Dredge on bottom UTC 11/03/17 02:47hrs, lat 35 47.09'S, long 178 57.75'W, depth 6754m

Dredge off bottom UTC 11/03/17 04:11hrs, lat 35 46.64'S, long 178 57,72'W, depth 6438m

total volume: 1/3 full, mud and some rocks

Comments: mud stones, no igneous material

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR37-1	1. Rock Type: sediment, muddy 2. Size: 16x14x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey brown 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: material was not cut								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR37-2	1. Rock Type: sediment 2. Size: 23x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey brown (surface) 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: silt-sand grain size, lineations / laminations. More brownish than other samples; material was not cut							GNS	
SO255-DR37-3	1. Rock Type: sediment 2. Size: 23x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey brown (surface) 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: similar to -1, not cut							GNS, UTAS	
SO255-DR37-4	1. Rock Type: sediment 2. Size: 12x10x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey brown (surface) 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: similar to sample -1, -3, not cut								
SO255-DR37-5	1. Rock Type: sediment 2. Size: 11x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey brown (surface) 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: fine lamination, not cut								
SO255-DR37-6	1. Rock Type: sediment 2. Size: 7x5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark brown, grey (surface) 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: sample taken by UTAS							UTAS	
SO255-DR37-7	1. Rock Type: sediment 2. Size: 7x4x2cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey brown (surface) 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: sample taken by UTAS							UTAS	

SO255-DR38

Description of Location and Structure: Kermadec Fore Arc, southern section at Rapuhia - Trench intersection; SE facing slope immediately above trench

Dredge on bottom UTC 11/03/17 09:13hrs, lat 35 44.56'S, long 178 56.44'W, depth 7071m

Dredge off bottom UTC 11/03/17 12:59hrs, lat 35 44.11'S, long 178 56,74'W, depth 6708m

total volume: 1/5 full

Comments: semi-consolidated mud stones

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR38-1	1. Rock Type: sediment, muddy 2. Size: 12x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey (surface) 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: material was not cut								
SO255-DR38-2	1. Rock Type: sediment, muddy 2. Size: 14x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: beige brown 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: material was not cut								
SO255-DR38-3	1. Rock Type: sediment, muddy 2. Size: 14x9x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige brown 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: similar to -1, material was not cut							GNS	
SO255-DR38-4	1. Rock Type: sediment, muddy 2. Size: 11x10x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige brown 5. Texture / Vesicularity: compressed, consolidated mud 7. Matrix: fine grained, muddy 10. Comment: similar to -2, material was not cut							GNS	

SO255-DR39

Description of Location and Structure: Kermadec Fore Arc, mid slope, NNE-SW striking step in slope, E facing slope along middle part

Dredge on bottom UTC 11/03/17 17:28hrs, lat 35 32.98'S, long 179 34.18'W, depth 4381m

Dredge off bottom UTC 11/03/17 18:30hrs, lat 35 32.72'S, long 179 34,43'W, depth 4077m

total volume: 1/3 full, mud and few rocks?

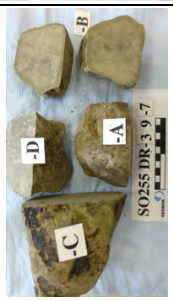
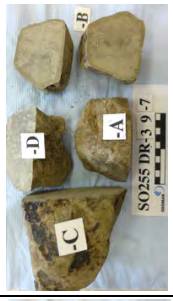
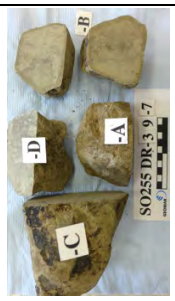
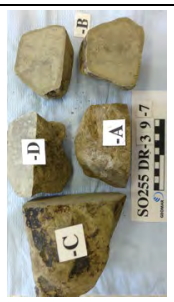
Comments: polymict breccias and sediment

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR39-1A	1. Rock Type: sediment, breccia conglomerate 2. Size: 7x5x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: similar to -1B, mostly black clasts up to 5mm 5. Texture / Vesicularity: small pebbles, clasts up to 1cm, unsorted 6. Phenocrysts: polymict clasts: shells, black mafic and felsic pebbles 7. Matrix: matrix supported								
SO255-DR39-1B	1. Rock Type: sediment, breccia conglomerate 2. Size: 13x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige / brown; clasts: black, red brown 5. Texture / Vesicularity: small pebbles, clasts up to 1cm, unsorted 6. Phenocrysts: polymict clasts: shells, black mafic and felsic pebbles 7. Matrix: matrix supported							GNS	
SO255-DR39-1C	1. Rock Type: sediment, breccia conglomerate, similar to -1B 2. Size: 3x3x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: similar to -1B 5. Texture / Vesicularity: very small pebbles <3mm 6. Phenocrysts: polymict clasts: shells, black mafic and felsic pebbles 7. Matrix: matrix supported								
SO255-DR39-2A	1. Rock Type: sediment, breccia conglomerate like 2. Size: 12x9x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige, small pebbles: brown, black, red, grey 5. Texture / Vesicularity: small pebbles up to 3mm, polymectic, unsorted 6. Phenocrysts: mafic, felsic pebbles , altered pebbles 7. Matrix: matrix supported							GNS, UTAS	
SO255-DR39-2B	1. Rock Type: sediment, breccia conglomerate like 2. Size: 11x11x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige, small pebbles: brown, red, grey 5. Texture / Vesicularity: small pebbles <1mm, unsorted 6. Phenocrysts: mafic, felsic pebbles , altered pebbles 7. Matrix: fine grained 9. Encrustations: medium grained crust							GNS	

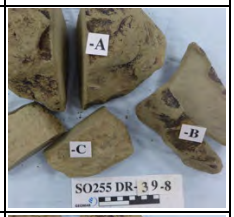
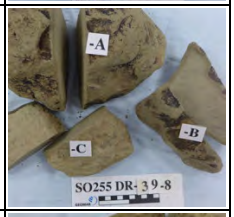
Appendix 2 (Station Details and Rock Description)

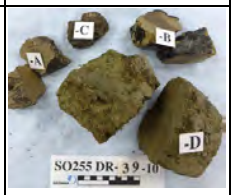
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR39-2C	1. Rock Type: sediment, similar to -2A & -2B 2. Size: 7x6x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: similar to -2B 5. Texture / Vesicularity: similar to -2B 7. Matrix: medium grained								
SO255-DR39-3	1. Rock Type: sediment, breccia conglomerate like 2. Size: 10x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, brown, black, red 5. Texture / Vesicularity: pebbles up to 5mm, sorted, medium fine grained 6. Phenocrysts: polymict 7. Matrix: fine grained							GNS	
SO255-DR39-4	1. Rock Type: sediment, breccia conglomerate like 2. Size: 13x8x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige, grey, brown, red 5. Texture / Vesicularity: unsorted small pebbles 6. Phenocrysts: mafic and felsic pebbles, polymict 7. Matrix: medium grained matrix supported, fine grained							GNS	
SO255-DR39-5	1. Rock Type: sediment 2. Size: 11x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige, pebbles: grey, black 5. Texture / Vesicularity: small pebbles, up to 5mm unsorted 6. Phenocrysts: felsic pebbles, few mafic, polymict 7. Matrix: very fine grained							GNS	
SO255-DR39-6A	1. Rock Type: sediment 2. Size: 21x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige, brown, grey 5. Texture / Vesicularity: coarse sand							GNS	
SO255-DR39-6B	1. Rock Type: sediment, similar to 6A 2. Size: 12x8x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige 5. Texture / Vesicularity: coarse sand							GNS	
SO255-DR39-6C	1. Rock Type: sediment, similar to 6A & -6B 2. Size: 8x7x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige 5. Texture / Vesicularity: coarse sand							GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR39-6D	1. Rock Type: sediment 2. Size: 8x7x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige, black, brown 5. Texture / Vesicularity: medium grained 7. Matrix: silicic matrix								
SO255-DR39-7A	1. Rock Type: sediment 2. Size: 4x7x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: beige, brown, black 5. Texture / Vesicularity: coarse sand 7. Matrix: silicic matrix							GNS	
SO255-DR39-7B	1. Rock Type: sediment 2. Size: 13x10x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: beige, brown 6. Phenocrysts: mafic specs, small <2mm brown pebbles 7. Matrix: fine grained							GNS	
SO255-DR39-7C	1. Rock Type: sediment 2. Size: 22x11x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: beige, brown 6. Phenocrysts: mafic specs, susoended in mud 7. Matrix: fine grained mud							GNS	
SO255-DR39-7D	1. Rock Type: sediment 2. Size: 11x8x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: beige, brown 6. Phenocrysts: mafic specs, susoended in mud 7. Matrix: fine grained mud							GNS	
SO255-DR39-8A	1. Rock Type: sediment 2. Size: 26x12x17cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige, brown 6. Phenocrysts: mafic specs, two brown pebbles (2x1cm, 11x7mm) 7. Matrix: fine grained							GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR39-8B	1. Rock Type: sediment 2. Size: 15x9x9 cm 3. Shape / Angularity: subrounded 4. Color of cut surface: beige, brown 6. Phenocrysts: mafic specs, two white pebbles (3mm, 2mm) 7. Matrix: fine grained							GNS	
SO255-DR39-8C	1. Rock Type: sediment 2. Size: 14x12x6 cm 3. Shape / Angularity: subrounded 4. Color of cut surface: beige, brown 6. Phenocrysts: mafic specs, two white pebbles (3mm, 2mm) 7. Matrix: fine grained							GNS	
SO255-DR39-9A	1. Rock Type: sediment 2. Size: 11x9x5 cm 3. Shape / Angularity: subrounded 4. Color of cut surface: beige, brown, black 6. Phenocrysts: 8mm pebbles up to 9mm, 5cm layer of very fine beige mud, 8mm of same material at top 7. Matrix: coarse to fine							GNS	
SO255-DR39-9B	1. Rock Type: sediment 2. Size: 16x10x5 cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown, beige 6. Phenocrysts: 4mm coarse sand, 1cm beige mudwith suspended mafic particles, 6.3cm brown mud, 8mm coarse sand 7. Matrix: coarse to fine							GNS	
SO255-DR39-9C	1. Rock Type: sediment 2. Size: 7x4x5 cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown, black, beige 6. Phenocrysts: 18mm sand to coarse clast (up to 4mm), 3.2cm beige / brown stained mud								
SO255-DR39-10A	1. Rock Type: sediment 2. Size: 10x5x6 cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark brown 7. Matrix: fine grained mud 10. Comment: cracks							GNS	
SO255-DR39-10B	1. Rock Type: sediment 2. Size: 9x7x5 cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige brown 6. Phenocrysts: 22mm beige brown mud, 23mm dark brown mud, 19mm beige mud with black streak 7. Matrix: fine grained mud 10. Comment: 3mm Mn crust								
SO255-DR39-10C	1. Rock Type: sediment 2. Size: 5x9x3 cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark brown 7. Matrix: dark brown fine grained, cracked mud								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR39-10D	1. Rock Type: sediment 2. Size: 18x12x9 cm 3. Shape / Angularity: subangular 4. Color of cut surface: green brown, dark brown, light brown 6. Phenocrysts: 28mm green brown mud, 13mm alternating dark brown, light brown, bandes mud 7. Matrix: fine grained								

SO255-DR40

Description of Location and Structure: Kermadec Fore Arc, mid slope, W-flank of a N-S striking (pull.apart?) basin. Track beneath hill at SW corner of basin

Dredge on bottom UTC 12/03/17 09:04hrs, lat 34 21.22'S, long 178 53.55'W, depth 5526m

Dredge off bottom UTC 12/03/17 10:25hrs, lat 34 20.92'S, long 178 53,90'W, depth 4954m

total volume: empty

SO255-NET41

Description of Location and Structure: Kermadec Fore Arc, mid slope, W-flank of a N-S striking (pull.apart?) basin. 5nm N of DR40. Net carried out before dredge

Net at 200mbsl UTC 12/03/17 13:05hrs, lat 34 15.94'S, long 178 52.22'W, depth 5526m seafloor, 200m winch

Net on deck UTC 12/03/17 13:13hrs, lat 34 15.94'S, long 178 52,23'W, depth 5699m seafloor, 0m winch

total volume: well filled sediment trap, dredge empty

SO255-DR42

Description of Location and Structure: Kermadec Fore Arc, mid slope, W-flank of a N-S striking (pull.apart?) basin. 5nm N of DR40.

Dredge on bottom UTC 12/03/17 15:06hrs, lat 34 15.92'S, long 178 52.25'W, depth 5688m

Dredge off bottom UTC 12/03/17 16:07hrs, lat 34 15.77'S, long 178 52,47'W, depth 5265m

total volume: empty

SO255-DR43

Description of Location and Structure: Kermadec Fore Arc, central section, mid slope, small scarp from base to top; scarp continuation of DR41 / 42 scarp.

Dredge on bottom UTC 13/03/17 01:58hrs, lat 33 5.51'S, long 178 14.82'W, depth 5486m

Dredge off bottom UTC 13/03/17 03:26hrs, lat 34 5.23'S, long 178 15,26'W, depth 5035m

total volume: few rocks

Comments: sediments

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR43-1	1. Rock Type: sedimentary rock, siltstone, somewhat altered, thin bands of Mn in cracks 2. Size: 12x10x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey - olive green / brownish 5. Texture / Vesicularity: generally fine medium grained; contains pocks of coarser grained material 6. Phenocrysts: contains altered Fsp 7. Matrix: fine - medium grained 9. Encrustations: mm-band of Mn crust 10. Comment: sedimentary rock of mainly volcanic origin							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR43-2	1. Rock Type: sedimentary rock, mud-siltstone, somewhat altered, similar to -1 but less consolidated 2. Size: 11x9x6cm 3. Shape / Angularity: rounded 4. Color of cut surface: ocre - olive green 5. Texture / Vesicularity: fine medium grained; one pock of sandy grained material 6. Phenocrysts: similar to -1; matrix seems to consist of Fsp with larger mm-sized black crystals 7. Matrix: fine - medium grained 9. Encrustations: mm-band of Mn crust 10. Comment: similar to -1 but more fine grained							GNS	
SO255-DR43-3	1. Rock Type: sediment 2. Size: 12x8x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light green 5. Texture / Vesicularity: generally mudy - silty; contains very fine sand medium pebble 6. Phenocrysts: invisible 7. Matrix: mud - silt grained, 5cm pebble is vesicular 9. Encrustations: <1mm Mn crust 10. Comment: contains medium pebble, 5cm, vesicular							GNS	

SO255-DR44

Description of Location and Structure: Kermadec Fore Arc, central section, lower slope, ESE facing slope above small basin (N-S striking). This is an area where the trench reaches 10.000 mbsl and the hanging walls displays a series of step-faults.

Dredge on bottom UTC 13/03/17 13:09hrs, lat 34 27.43'S, long 177 34.22'W, depth 8595m

Dredge off bottom UTC 13/03/17 14:27hrs, lat 32 27.32'S, long 177 34,70'W, depth 8202m

total volume: few

Comments: pieces of sediment, semi-consolidated

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR44-1	1. Rock Type: sediment, semi-consolidated mud 2. Size: 24x13x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown - green 5. Texture / Vesicularity: fine grained mud								
SO255-DR44-2	1. Rock Type: sediment, semi-consolidated mud 2. Size: 16x18x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown - green 5. Texture / Vesicularity: fine grained mud 10. Comment: sample is entirely fro GNS							GNS	
SO255-DR44-3	1. Rock Type: sediment, semi-consolidated mud 2. Size: 12x10x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown - green 5. Texture / Vesicularity: fine grained mud								

SO255-DR45

Description of Location and Structure: Kermadec Fore Arc, central section, large scarp directly W of the trench, mid-slope

Dredge on bottom UTC 13/03/17 23:53hrs, lat 31 51.72'S, long 177 20.23'W, depth 8774m

Dredge off bottom UTC 14/03/17 02:12hrs, lat 31 51.43'S, long 177 21,14'W, depth 7787m

total volume: few, single hard rock, mudstones

Comments: single piece of fine grained gabbro, subrounded shape may indicate transport from further up. May contain datable Fsp and Amph and Zircon. Otherwise small volcaniclastic rocks and sediment.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR45-1	1. Rock Type: plutonic, holocrystalline, could be a fine grained gabbro or diabase, moderately altered 2. Size: 16x14x12cm 3. Shape / Angularity: subrounded to rounded, appears to have undergone a transport process 4. Color of cut surface: light grey to light greenish 5. Texture / Vesicularity: hypidiomorphic tecture, non-vesicular 6. Phenocrysts: Plg white, 1-3 mm, 30-40%, Px light brown to grey, appears altered in many places, ~2 mm , 20-30%, Amph black, up to 3mm, 5% 8. Secondary Minerals: possibly Chl since rock has a light green coloration 9. Encrustations: none, exept sub mm patches of mud 10. Comment: check for zircons ---> U-Pb dating, Amph and Plg should be checked for freshness and may provide cooling ages by Ar-Ar. Rounding indicates transport, so rock is likely to originate from upsection and does not necessarily represent insitu rock of the cliff	x_air freight box	x	3	Plg, Amph, Zr?			GNS	
SO255-DR45-2	1. Rock Type: volcaniclastic?, highly altered 2. Size: 6x3.5x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: small pebble clasts up to 5mm 6. Phenocrysts: mafic and felsic clasts 7. Matrix: fine grained								
SO255-DR45-3	1. Rock Type: volcaniclastic? 2. Size: 5.5x6x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey - black 5. Texture / Vesicularity: contains some small pebbles 6. Phenocrysts: similar to -2 7. Matrix: fine grained 8. Secondary Minerals: shiny mineral, probably pyrite 10. Comment: not cut, similar to -2								
SO255-DR45-4	1. Rock Type: similar to -2, volcaniclastic 2. Size: 5.5x6x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: small pebbles up to 4mm 6. Phenocrysts: mafic clasts 7. Matrix: fine grained								
SO255-DR45-5	1. Rock Type: volcaniclastic? 2. Size: 5x6x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey - black 5. Texture / Vesicularity: contains some small pebbles 6. Phenocrysts: similar to -2, -3 7. Matrix: fine grained 8. Secondary Minerals: similar to -2, -3							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR45-6	1. Rock Type: volcaniclastic, highly altered, similar to -2 2. Size: 5x6x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: small pebbles up to 1cm 6. Phenocrysts: mafic clasts 7. Matrix: fine grained 8. Secondary Minerals: fine grained								
SO255-DR45-7	1. Rock Type: sediment, mudstone?, sandstone? 2. Size: 12x8x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey - dark grey 5. Texture / Vesicularity: visible layering, individual layers up to 1.2cm, medium to fine sand 7. Matrix: fine grained							GNS	
SO255-DR45-8	1. Rock Type: sedimentary rock 2. Size: 15x8x5cm 3. Shape / Angularity: angular 4. Color of cut surface: yellowish brown 5. Texture / Vesicularity: visible layering 7. Matrix: fine sand 10. Comment: volcanic sand							GNS	
SO255-DR45-9	1. Rock Type: sediment sandstone 2. Size: 20x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige 5. Texture / Vesicularity: fine to medium 7. Matrix: fine grained							GNS	

SO255-DR46

Description of Location and Structure: Kermadec Fore Arc, central section, upper slope of DR45 scarp, repetition of DR45 in order to eventually obtain additional igneous material

Dredge on bottom UTC 14/03/17 05:25hrs, lat 31 51.17'S, long 177 20.44'W, depth 8477m

Dredge off bottom UTC 14/03/17 09:19hrs, lat 31 51.22'S, long 177 20,97'W, depth 7937m

total volume: few

Comments: small blocks of freshly broken semi-consolidated sediment

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR46-1	1. Rock Type: sediment, consolidated mud 2. Size: 20x12x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to dark-greenish grey 5. Texture / Vesicularity: individual c. 1cm layers visible 7. Matrix: fine grained, layered sand - silt 10. Comment: layers partly faulted							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR46-2	1. Rock Type: sediment, consolidated mud 2. Size: 15x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: layered, 4-5 individual layers visible, non vesicular 7. Matrix: fine grained sand - silt, up to 1-2 cm layers 10. Comment: thin silty layers (2mm) between sandy layers (~8mm); overall similar to -1								
SO255-DR46-3	1. Rock Type: sediment, consolidated mud 2. Size: 19x13x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: partly brown, partly grey 5. Texture / Vesicularity: layered, faulted, non-vesicular, fractured 7. Matrix: fine grained sand 10. Comment: more coarse grained, grey lense within fine grained brown matrix. Felsic grains (Fsp) in coarser matrix. Grey part simlar to sample -1 & -2							GNS	
SO255-DR46-4	1. Rock Type: sediment, consolidated mud 2. Size: 15x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: layered, non-vesicular 7. Matrix: fine grained, sandy 10. Comment: simlar to brown part of sample -3								

SO255-DR47

Description of Location and Structure: Kermadec Fore Arc, northern section, upper section at step in the lower slope above trench

Dredge on bottom UTC 15/03/17 01:15hrs, lat 29 46.81'S, long 176 26.27'W, depth 8106m

Dredge off bottom UTC 15/03/17 02:46hrs, lat 29 47.19'S, long 176 26,56'W, depth 7737m

total volume: 1/6 full

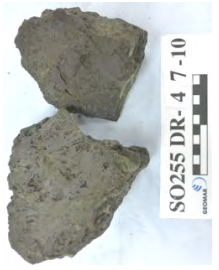
Comments: Notably this dredge recovered igneous material! -1 is a fairly fresh, dense, Fsp-Px phyric rock that could be part of a dike or center of a thick lava flow. Serpentinite attached in patches on outside of rock; part of a mélange? -2 through -9 are more strongly to very strongly altered Fsp-Px phyric volcanics. -10 to -16 various volcaniclastics and -17 to -20 are sediments.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR47-1	1. Rock Type: volcanic, fresh, maybe center of thick lava flow or dike, fairly heavy / dense, near vesicle free 2. Size: 29x14x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, weakly vesicular <1%, <1mm 6. Phenocrysts: Fsp 25%, <5mm, Px ~10%, <2mm 7. Matrix: fine grained, dense, contains phenocrysts 8. Secondary Minerals: greenish mineraly on rock surface ---> serpentinite in patches 10. Comment: Fsp contains inclusions of Px, fresh phenocrysts	x_air freight box	x	2-3				GNS	

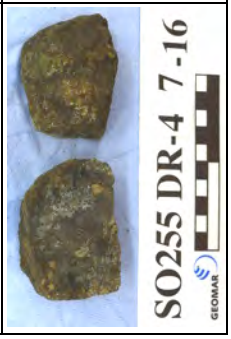
Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR47-2	1. Rock Type: volcanic, weakly altered, andesitic comp.? 2. Size: 9x6x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: porphyritic, dense 6. Phenocrysts: Fsp 25%, <5mm, Px ~10%, <2mm, Qtz along veins 7. Matrix: fine grained, dense, contains phenocrysts and fractures 8. Secondary Minerals: greenish mineraly on rock surface ---> serpentinite in patches 9. Encrustations: 10. Comment: Inclusions of Px in Fsp, phenocrysts slightly weathered	x_air freight box	x	3				GNS	
SO255-DR47-3	1. Rock Type: volcanic, moderately altered, andesitic comp.? 2. Size: 9x10x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, dense 6. Phenocrysts: Fsp 20%, <4mm, weathered, partly blue-green discolored; Px as inclusions im Fsp, Qtz? 7. Matrix: fine grained, dense, phenocrysts weathered 8. Secondary Minerals: Fsp partly altered to Chl 10 Comment: phenocrysts moderately weathered	x_air freight box	x	3-4				GNS	
SO255-DR47-4	1. Rock Type: volcanic, strongly altered 2. Size: 7x4x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey - black 5. Texture / Vesicularity: porphyritic, dense 6. Phenocrysts: Fsp 20%, <5mm 7. Matrix: fine grained, fractures 8. Secondary Minerals: CC veins 9. Encrustations: crust of altered minerals, CC?								
SO255-DR47-5	1. Rock Type: volcanic, strongly altered 2. Size: 13x8x5cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey - black 5. Texture / Vesicularity: porphyritic, dense 6. Phenocrysts: Fsp 20%, <4mm, strongly altered, chloritized (greenish), weathered, Px as inclusion in Fsp 7. Matrix: fine grained 8. Secondary Minerals: greenish serpentinite? as patches on outer surface of rock 9. Encrustations: altered minerals as crust ---> serpentinite							GNS	
SO255-DR47-6	1. Rock Type: volcanic, strongly altered 2. Size: 8x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey with brownish - green altered parts 5. Texture / Vesicularity: porphyritic, with 10% vesicles 6. Phenocrysts: Fsp 5%, ~1mm, strongly altered, often completely destroyed so thate they form vesicles 7. Matrix: fine grained 8. Secondary Minerals: vesicle filling and cracks filled with CC and other brownish material, Chl as alteration product of Fsp 9. Encrustations: thin greenish black crust 10. Comment: phenocrysts are difficult to distinguish between Fsp and CPx	x							

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR47-7	1. Rock Type: volcanic, strongly altered 2. Size: 9x6x4.5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey slightly greenish 5. Texture / Vesicularity: porphyritic, dense 6. Phenocrysts: Fsp 20-25%, 1-4mm, strongly altered 7. Matrix: fine grained 8. Secondary Minerals: alteration of Fsp (Chl) starting from center, cracks filled with secondary minerals 9. Encrustations: greenish black alteration crust 10. Comment: phenocrysts could be partly Cpx								
SO255-DR47-8	1. Rock Type: volcanic, strongly altered 2. Size: 9x7x4cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, altered parts are black 5. Texture / Vesicularity: porphyritic, dense 6. Phenocrysts: Fsp with Px inclusions 25%, 1-5mm, strongly altered 7. Matrix: fine grained 8. Secondary Minerals: cracks filled with white brownish material 9. Encrustations: thin black-greenish coating	x						GNS	
SO255-DR47-9	1. Rock Type: volcanic, completely altered 2. Size: 26x17x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey with brownish-red parts 5. Texture / Vesicularity: porphyritic, pores along the outer part filled with sediment 6. Phenocrysts: Fsp with Px inclusions 25%, strongly altered or completely weathered 20-30%, 1-5mm 7. Matrix: fine grained, strongly altered 8. Secondary Minerals: filled veins, altered Fsp with grey brown color 9. Encrustations: thin grey-green coating 10. Comment: samples seem to be similar to those before but is compltetely altered	x						GNS	
SO255-DR47-10	1. Rock Type: volcanic, volcaniclastic 2. Size: 13x13x9cm 3. Shape / Angularity: angular 4. Color of cut surface: black with green veins 5. Texture / Vesicularity: fractured rock with many pores and cracks 7. Matrix: fine grained, strongly altered 8. Secondary Minerals: olive - greenish material filling up veins and forming a thin coating on the outsinde 9. Encrustations: thin olive-green coating 10. Comment: green material could be serpentinite	x						GNS	
SO255-DR47-11	1. Rock Type: volcanic, volcaniclastic 2. Size: 16x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black with green veins 5. Texture / Vesicularity: fractured rock with many pores and cracks 7. Matrix: fine grained, strongly altered 8. Secondary Minerals: olive - greenish material filling up veins and forming a thin coating on the outsinde 9. Encrustations: thin olive-green coating 10. Comment: similar to -10	x						GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR47-12	1. Rock Type: volcanic, volcaniclastic, strongly altered 2. Size: 16x3x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey clasts, greenish brown matrix 5. Texture / Vesicularity: volcanic fragments within brecciated groundmass, variable degrees of alteration and amounts of phenocrysts within the clasts 6. Phenocrysts: Fsp size and ampunt vary between clasts, strongly altered 7. Matrix: brecciated matrix 8. Secondary Minerals: Fsp altered 9. Encrustations: no encrustation								
SO255-DR47-13	1. Rock Type: volcanic, volcaniclastic, strongly altered 2. Size: 16x9x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black some fragments brown 5. Texture / Vesicularity: small and large clasts within a fine grained matrix, many veins cut across matrix, rock is fractured 7. Matrix: fine grained, strongly altered 8. Secondary Minerals: whitish green filling of the veins								
SO255-DR47-14	1. Rock Type: volcanic, volcaniclastic, strongly altered 2. Size: 20x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish green alteration rim, greenish grey in center 5. Texture / Vesicularity: large (1-2 cm) and small (2-5mm) clasts within a fine grained matrix 6. Phenocrysts: no but magnetite as grains in the grondmass 7. Matrix: fine grained, more altered along rim 10. Comment: rock is weakly magnetic due to magnetite	x						GNS	
SO255-DR47-15	1. Rock Type: volcanic, volcaniclastic, strongly altered 2. Size: 9x7x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish green alteration rim, greenish grey in center 5. Texture / Vesicularity: large (1-2 cm) and small (2-5mm) clasts within a fine grained matrix 6. Phenocrysts: no but magnetite as grains in the grondmass 7. Matrix: fine grained, more altered along rim 10. Comment: similar to -14 and also weakly magnetic							GNS	
SO255-DR47-16	1. Rock Type: volcanic, volcaniclastic, some alteration 2. Size: 6x4x7cm 3. Shape / Angularity: subangular clasts 2-35mm 4. Color of cut surface: clast colors range from dark grey to brownish grey to tan 5. Texture / Vesicularity: brecciatedm polymict orthoconglomerate, very little matrix 7. Matrix: very little matrix 8. Secondary Minerals: white minerals grown within fractures								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR47-17	1. Rock Type: sediment, conglomerate 2. Size: 10x7x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to brown 5. Texture / Vesicularity: many clasts, mm to 1cm, matrix supported 7. Matrix: compacted mud 9. Encrustations: thin Mn coating								
SO255-DR47-18	1. Rock Type: sediment 2. Size: 9x6x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light brown 7. Matrix: fine to medium grained, some parts have turbulent structures 9. Encrustations: thin Mn coating								
SO255-DR47-19	1. Rock Type: sediment 2. Size: 8x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light brown - green 7. Matrix: muddy to fine grained 10. Comment: finer than the prev. sample								
SO255-DR47-20	1. Rock Type: sediment 2. Size: 8x8x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light brown - green 7. Matrix: thin fine grained layers between muddy matrix								

SO255-DR48

Description of Location and Structure: Kermadec Fore Arc, northern section, E facing cliff immediately above trench. Track oblique to slope due to wind direction 220°

Dredge on bottom UTC 15/03/17 11:07hrs, lat 29 8.07'S, long 176 9.016'W, depth 8500m

Dredge off bottom UTC 15/03/17 12:28hrs, lat 29 8.47'S, long 176 9,40'W, depth 8220m

total volume: empty

Comments: chain bag was turned inside out ---> no rocks could get in

SO255-DR49

Description of Location and Structure: Kermadec Fore Arc, northern section, repeat of DR48 5nm further N. E-facing slope above trench, upper section, track oblique to slope du to wind conditions

Dredge on bottom UTC 15/03/17 11:07hrs, lat 29 8.07'S, long 176 9.016'W, depth 8500m

Dredge off bottom UTC 15/03/17 12:28hrs, lat 29 8.47'S, long 176 9,40'W, depth 8220m

total volume: few

Comments: sediment

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR49-1	1. Rock Type: sediment, mudstone 2. Size: 11x10x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish to light grey 5. Texture / Vesicularity: massive, clay 9. Encrustations: brownish alteration rim								

SO255-CTD50

Description of Location and Structure: Kermadec Fore Arc, northern section, Area upsection of large seamount, located approx. mid-slope

Start UTC 16/03/17 03:58hrs, lat 29 41.94'S, long 176 49.05'W, depth 4986m

On deck UTC 16/03/17 07:12hrs, lat 29 41.95'S, long 176 49,00'W, depth 8220m

SO255-DR51

Description of Location and Structure: Kermadec Fore Arc, northern section, large N-S trending seamount within fore arc slope above trench. N facing slope at southern cone along NE-SW strinking ridge

Dredge on bottom UTC 16/03/17 10:10hrs, lat 29 48.83'S, long 176 43.12'W, depth 4450m

Dredge off bottom UTC 15/03/17 11:25hrs, lat 29 49.22'S, long 176 43,19'W, depth 4150m

total volume: 1/6 full

Comments: mostly sediment, three (-1 to -3) questionable igneous rocks that could be also sandstone, to be confirmed by TS. -4 to -6 breccias with mm sized clasts.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR51-1	1. Rock Type: sediment - volcanic? ---> sandstone?! 2. Size: 8x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: fine grained, sandy, weak vesicularity <1% <1mm, filled with CC, fractured, partly rounded fragments in matrix <6mm 6. Phenocrysts: rounded sedimentary fragments <6mm, felsic (<1mm) and mafic phenocrysts visible in groundmass 7. Matrix: fine grained, well sorted 8. Secondary Minerals: vesicle fillings CC 9. Encrustations: thin Mn coating 10. Comment: dense but realtively light. Check TS to confirm sediment origin	x_air freight box	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR51-2	1. Rock Type: sediment ---> sandstone 2. Size: 8x6x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: fine grained, sandy, moderate vesicularity ~5% <2mm, filled with CC 6. Phenocrysts: small felsic and mafic phenocrysts grains in matrix <1mm 7. Matrix: fine grained, well sorted 8. Secondary Minerals: vesicle fillings CC, green and red minaral grains within matrix <1%, <1mm 9. Encrustations: thin Mn coating 10. Comment: similar to -1 but darker in color. Check TS to confirm sediment origin	x_air freight box	x					GNS	
SO255-DR51-3	1. Rock Type: sediment ---> sandstone 2. Size: 6x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light brown 5. Texture / Vesicularity: fine grained, sandy, weak vesicularity <1% <1mm, filled 6. Phenocrysts: small felsic and mafic phenocrysts grains in matrix <1mm 7. Matrix: fine grained, moderately to well sorted 8. Secondary Minerals: vesicle fillings CC, red mineral grains in matrix <1%, <1mm 9. Encrustations: thin Mn coating 10. Comment: Check TS to confirm sediment origin	x						GNS	
SO255-DR51-4	1. Rock Type: sediment, brecciated / conglomerate, strongly altered and weathered 2. Size: 12x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: mixture of brown-black-yellow-grey components 5. Texture / Vesicularity: moderate vesicularit, filled 6. Phenocrysts: different kinds of rounded sediment fragments, ~30%, <5mm, felsic phenocrysts within groundmass, rounded, <10%, <2mm 7. Matrix: medium coarse grained 8. Secondary Minerals: vesicle fillings,green and red mineral fragments, rounded ~2mm							GNS	
SO255-DR51-5	1. Rock Type: sediment, breccia 2. Size: 9x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to brown 5. Texture / Vesicularity: clast supported breccia, clasts 1-10mm, some clasts slightly vesicular, clasts make up 90% of the rock 7. Matrix: fine grained, only small amount 10% 8. Secondary Minerals: alteration of the matrix 9. Encrustations: thin olive green coating made of mud							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR51-6	1. Rock Type: sediment, breccia 2. Size: 8x7x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to brown, few clasts have a red color 5. Texture / Vesicularity: clast supported breccia, clasts 1-10mm, some clasts are vesicular, clasts make up 90% of the rock 7. Matrix: fine grained, only small amount 10% 8. Secondary Minerals: alteration of the matrix 9. Encrustations: thin olive green coating made of mud 10. Comment: similar to -5							GNS	
SO255-DR51-7	1. Rock Type: sediment, medium grained and strongly altered 2. Size: 7x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey grains and strongly altered brownish grains 5. Texture / Vesicularity: well sorted sediment, lamination between layers with and less dark grey grains visible 7. Matrix: fine grained matrix 8. Secondary Minerals: strong alteration of minerals so that they appear brownish 9. Encrustations: only thin coating							GNS	
SO255-DR51-8	1. Rock Type: sediment, fine grained 2. Size: 10x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown layers with a few dark grey layers inbetween 5. Texture / Vesicularity: fine grained and well sorted, fine lamination, lamination visible, frock is fractured and cracks partly filled with black material (Mn?) 7. Matrix: fine grained matrix 8. Secondary Minerals: strong alteration of minerals so that they appear brownish 9. Encrustations:only thin coating							GNS	
SO255-DR51-9	1. Rock Type: sediment, sandstone 2. Size: 7x6x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black - light grey, striped 5. Texture / Vesicularity: fine grained sandy, laminated, dense 6. Phenocrysts: none 7. Matrix: fine grained with cross bedding 9. Encrustations: silty mud on surfaces 10. Comment: light and dark sediment laminations with changing sedimentation rates							GNS	
SO255-DR51-10	1. Rock Type: sediment, consolidated mud 2. Size: 12x11x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige brown 5. Texture / Vesicularity: fine grained muddy, sandy silt 6. Phenocrysts: none 7. Matrix: consolidated mud 8. Secondary Minerals: 9. Encrustations: thin Mn coating							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR51-11	1. Rock Type: sediment, consolidated mud 2. Size: 15x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: fine grained muddy, clay silt 6. Phenocrysts: none 7. Matrix: consolidated mud 8. Secondary Minerals: filled veins (probably with mud) 9. Encrustations: thin Mn coating							GNS	

SO255-DR52

Description of Location and Structure: Kermadec Ridge, northern section of working area, small step just beneath ridge crest at the western flank of Kermadec Ridge

Dredge on bottom UTC 16/03/17 21:07hrs, lat 29 52.22'S, long 178 20.07'W, depth 1603m

Dredge off bottom UTC 16/03/17 23:38hrs, lat 29 52.72'S, long 178 19,75'W, depth 1100m

total volume: few rocks

Comments: various volcaniclastics

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR52-1	1. Rock Type: volcaniclastic rock 2. Size: 9x8x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: generally brown, one large clast = dark grey 5. Texture / Vesicularity: small pebbles, 5% vesicles in clast, ø3cm 6. Phenocrysts: 5% felsic, Plg?; 5%mafic, Px, MT 7. Matrix: white matrix, altered glass 9. Encrustations: 2mm Mn crust 10. Comment: contains large glassy clast ø 3cm	x						GNS	
SO255-DR52-2	1. Rock Type: volcaniclastic rock 2. Size: 8x10x4cm 3. Shape / Angularity: angular 4. Color of cut surface: brown, ~light grey clasts 5. Texture / Vesicularity: medium ~small pebbles 6. Phenocrysts: glassy clasts, aphyric 7. Matrix: white matrix 8. Secondary Minerals: shiny minerals, pyrite 9. Encrustations: 2mm Mn crust 10. Comment: similar to -1, but no large clasts							GNS	
SO255-DR52-3	1. Rock Type: volcaniclastic rock 2. Size: 27x17x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellowish brown 5. Texture / Vesicularity: <1cm altered crust, line texture 7. Matrix: altered yellow matrix 8. Secondary Minerals: clay minerals 9. Encrustations: 1mm Mn crust 10. Comment: very altered							GNS	
SO255-DR52-4	1. Rock Type: volcaniclastic rock 2. Size: 22x16x6cm 3. Shape / Angularity: rounded, plane 4. Color of cut surface: yellowish brown 5. Texture / Vesicularity: <1cm altered crust, line texture 7. Matrix: altered yellow matrix 8. Secondary Minerals: clay minerals 9. Encrustations: 2mm Mn crust 10. Comment: very altered								

SO255-DR53

Description of Location and Structure: Kermadec Ridge, northern section of working area, same step as in DR52, upper slope above slump structures

Dredge on bottom UTC 17/03/17 01:49hrs, lat 29 48.53'S, long 178 15.58'W, depth 1210m

Dredge off bottom UTC 17/03/17 03:21hrs, lat 29 48.79'S, long 178 15,42'W, depth 958m

total volume: few rocks

Comments: various volcaniclastics

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR53-1	1. Rock Type: volcaniclastic rock containing fragments of lava; some Fsp bearing 2. Size: 20x12x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown matrix, multi colored clasts 5. Texture / Vesicularity:polymictic lava fragments, vesicular up to 1mm ø 6. Phenocrysts: some lava fragments contain Fsp ±Px ±Ol 7. Matrix: fine grained lava fragments with brown altered cement 9. Encrustations: 9mm Mn crust 10. Comment: largest clast 3x2cm								
SO255-DR53-2	1. Rock Type: volcaniclastic rock 2. Size: 11x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light brown matrix, multi colored clasts, mostly orange-red 5. Texture / Vesicularity: polymictic 7. Matrix: medium grained 10. Comment: some clasts have vesicles, largest clasts 1x2cm								
SO255-DR53-3	1. Rock Type: volcaniclastic rock containing fragments of lava; some Fsp bearing 2. Size: 10x7x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: matrix not defined, clasts multicolored 5. Texture / Vesicularity: polymictic 7. Matrix: medium grained: 9. Encrustations: 1mm Mn crust 10. Comment: largest clast 9x6mm								
SO255-DR53-4	1. Rock Type: volcaniclastic rock 2. Size: 10x8x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: light brown matrix, multi colored clasts 5. Texture / Vesicularity: polymictic 6. Phenocrysts: some lava fragments contain Fsp ±Px ±Ol 7. Matrix: medium grained 9. Encrustations: 2mm Mn crust 10. Comment: largest clast1.1x1cm								

SO255-DR54

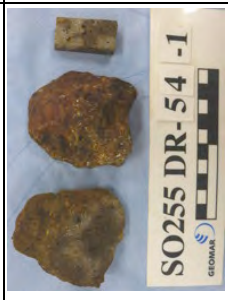
Description of Location and Structure: Kermadec Ridge, northern section of working area, same step as in DR52 + 53, central part from base to top

Dredge on bottom UTC 17/03/17 05:08hrs, lat 29 50.00'S, long 178 17.33'W, depth 1477m

Dredge off bottom UTC 17/03/17 06:13hrs, lat 29 50.14'S, long 178 16,97'W, depth 1165m

total volume: 1/3 full

Comments: volcaniclastics that contain larger lava clasts some of which appear suitable for geochemistry. DR52 through DR54 were all carried out along a W-facing slope of the Kermadec Ridge and provided almost exclusively volcaniclastic material. This could also stem from nearby volcanic front volcanoes and therefore does not necessarily represent older Kermadec / Vitiaz basement.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR54-1	1. Rock Type: volcanic rock, altered 2. Size: 7x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish-grey 5. Texture / Vesicularity: vesicular c.10%; vesicles partly filled 6. Phenocrysts: Fsp-phyric, altered, 0.5-1mm across 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with secondary minerals (zeolite?); strong alteration of phenocrysts 9. Encrustations: mm thin Mn oxide coating 10. Comment: rock is strongly altered, could also be a sediment, check TS before further processing	x							
SO255-DR54-2	1. Rock Type: sedimentary breccia, one clast was removed for GC 2. Size: 13x10x8cm/clast size 2.5x2x1.5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish-grey clast in brown matrix (amongst red, orange and grey clasts 5. Texture / Vesicularity: vesicular c.10%; vesicles partly filled 6. Phenocrysts: Clast Cpx-phyric (5%), less than 1mm across 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with secondary minerals (zeolite?); strong alteration of phenocrysts 9. Encrustations: mm thin Mn oxide coating 10. Comment:rock is strongly altered, could also be a sediment, check TS before further processing	x	x						
SO255-DR54-3	1. Rock Type: sedimentary breccia, one clast was removed for GC 2. Size: 15x11x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown with red orange andgrey clasts 5. Texture / Vesicularity: clast supported, poorly sorted breccia, clasts between 0.3 - 8cm 7. Matrix: fine grained 9. Encrustations: thin Mn oxide coating 10. Comment: one large volcanic clast was removed and a 8x7x3.5 GC slab and TS were cut, 1) volcanic, strongly altered, 2) 8x7x3.5cm (GC size), 4) greenish grey, 5) aphyric, few vesicles, fine grained, 8) filling of vesicles CC?, dendritic Mn	x	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR54-4	1. Rock Type: sediment, breccia 2. Size: 41x32x24cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown with orange red and grey clasts 5. Texture / Vesicularity: matrix supported, poorly sorted sediment, clasts between 0.1 - 4cm 9. Encrustations: thin Mn coating 10. Comment: representative for most rocks of the dredge	x						GNS	
SO255-DR54-5	1. Rock Type: sediment, breccia 2. Size: 21x21x19cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown with dark red, orange, grey and green clasts 5. Texture / Vesicularity: matrix supported, poorly sorted sediment, clasts between 0.1 - 1.5cm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: similar to -4	x						GNS	
SO255-DR54-6	1. Rock Type: sediment, breccia 2. Size: 16x14x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown with dark grey, green and few red clasts 5. Texture / Vesicularity: clast supported, poorly sorted breccia, one large clasts has several smaller clasts in it, clast size between 0.2 - 6cm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: one large slice cut for UTAS							UTAS	
SO255-DR54-7	1. Rock Type: sediment, breccia 2. Size: 18x16x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown with orange, red, dark and light grey clasts 5. Texture / Vesicularity: clast supported, poorly sorted sediment, clasts between 0.3 - 2cm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: one slice cut for UTAS							UTAS	
SO255-DR54-8	1. Rock Type: sediment, fine grained with few clasts 2. Size: 12x9x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: white with few black and green clasts 5. Texture / Vesicularity: matrix supported, fine grained sediment, no vesicles 7. Matrix: fine grained maybe CC 9. Encrustations: thin Mn coating 10. Comment: could be made of CC mud	x						GNS	
SO255-DR54-9X	1. Rock Type: sediment, breccia 2. Size: 11x9x5cm 3. Shape / Angularity: angular 4. Color of cut surface: brown with grey, red and orange clasts 5. Texture / Vesicularity: matrix supported, poorly sorted sediment, clasts between 0.1 - 1.5cm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: similar to -4 and -5	x							

SO255-DR55

Description of Location and Structure: Kermadec Volcanic Front, Giggenbach Volcanic Field, Easternmost cone, W-flank along mid-slope

Dredge on bottom UTC 17/03/17 05:08hrs, lat 29 57.89'S, long 178 35.64'W, depth 1550m

Dredge off bottom UTC 17/03/17 10:58hrs, lat 29 58.09'S, long 178 35,27'W, depth 1230m

total volume: 2/3 full

Comments: abundant fresh Plg-Px phyric pillow lava with glassy margins

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR55-1	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 18x14x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, 25% vesicles up to 5mm ø, open 6. Phenocrysts: Plg 10% up to 4mm fresh; Px 10% up to 4mm rel. fresh; Ol <5% up to 3mm rel. fresh 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with secondary minerals (zeolite?); strong alteration of phenocrysts 9. Encrustations: thin Mn coating, glass rim up to 5mm, phenocryts within glass rim 10. Comment: representative for whole dredge; under the glass rim are fresh phenocryts, thin layer of palagonite	x_air freight box	x	1-2	GL			GNS	
SO255-DR55-2	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 20x20x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, 30% vesicles up to 1cm ø, open 6. Phenocrysts: Plg 7% up to 5mm fresh; Px 10-15% up to 7mm; Ol <1% up to 2mm rel. fresh 7. Matrix: see -1 8. Secondary Minerals: see -1 9. Encrustations: see -1 10. Comment: less glassy sections than -1	x_air freight box	x	1-2	GL			GNS	
SO255-DR55-3	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 15x15x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, 25% vesicles <1cm ø, open 6. Phenocrysts: Plg 10% <5mm fresh; Px 10% <3mm fresh; Ol <1% <2mm fresh 7. Matrix: see -1 8. Secondary Minerals: see -1 9. Encrustations: see -1 10. Comment: vesicle distribution mimics cooling horizons	x_air freight box	x	1-2	GL			GNS	
SO255-DR55-4	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 13x12x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, 30% vesicles <5mm ø, open 6. Phenocrysts: Plg 10% <5mm fresh; Px 7% <5mm fresh; Ol <1% <2mm fresh 7. Matrix: see -1 8. Secondary Minerals: see -1 9. Encrustations: see -1 10. Comment: vesicle distribution mimics cooling horizons	x_air freight box	x	1-2	GL			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR55-5	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 16x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, 25% vesicles <5mm ø, open 6. Phenocrysts: Plg 5% <4mm fresh; Px 7% <4mm fresh; Ol <1% <1mm fresh 7. Matrix: see -1 8. Secondary Minerals: see -1 9. Encrustations: see -1 10. Comment: crack in matrix filled with brown material			2					
SO255-DR55-6	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 13x11x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, 30% vesicles <5mm ø, open 6. Phenocrysts: Plg 7% <5mm fresh; Px 10% <3mm fresh; Ol <1% <2mm fresh 7. Matrix: see -1 8. Secondary Minerals: see -1 9. Encrustations: thin Mn coating, glassy rim 7mm 10. Comment: crack in matrix filled with brown material			1-2					
SO255-DR55-7	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 30x20x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, 30% vesicles <1cm ø, open 6. Phenocrysts: Plg 10% <5mm fresh; Px 10% <5mm fresh; Ol <1% <2mm fresh 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: thin Mn crust, glassy rim 5mm 10. Comment: glomerophyric inergrowth of Plg and Px phenocrysts			1-2				GNS	
SO255-DR55-8	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 16x8x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: uncut sample, probably similar to others 10. 10. Comment: back up sample			1-2					
SO255-DR55-9	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 21x17x16cm sample piece, 30x28x28cm original size 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, vesicles 25%, <7mm, open 6. Phenocrysts: Plg 7% <3mm fresh; Px 10%, <5mm, fresh; Ol 1% <3mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating, glassy rim 4mm 10. Comment: part of larger block K			1-2					

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR55-10	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 16x13x12cm sample piece, 29x28x26cm original size 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, vesicles 25%, <5mm, open 6. Phenocrysts: Plg 5% <5mm fresh; Px 5%, <4mm, fresh; Ol 1% <2mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating, glassy rim 6mm 10. Comment: part of larger block B			1-2					
SO255-DR55-11	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 22x18x16cm sample piece, 31x23x23cm original size 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porpyritic, vesicles 25%, <6mm, partlx filled with CC / sediment 6. Phenocrysts: Plg 5% <4mm fresh; Px 10%, <5mm, fresh; Ol 1% <2mm relatively fresh 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: thin Mn coating, glassy rim 4mm 10. Comment: part of larger block E			1-2					
SO255-DR55-12	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 19x14x11cm sample piece, 24x16x14cm original size 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porpyritic, vesicles 25%, <5mm, open 6. Phenocrysts: Plg 7% <5mm fresh; Px 10%, <5mm, fresh; Ol 1% <2mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating, glassy rim 3mm 10. Comment: part of larger block V			1-2				GNS	

SO255-DR56

Description of Location and Structure: Kermadec Volcanic Front, Giggenbach Volcanic Field, cone E of large central cone, NW facing slope, beneath summit

Dredge on bottom UTC 17/03/17 12:47hrs, lat 30 0.69'S, long 178 39.09'W, depth 1050m

Dredge off bottom UTC 17/03/17 14:05hrs, lat 30 0.95'S, long 178 38,63'W, depth 694m

total volume: 1/2 full

Comments: abundant highly Plg phyric pillow lava, some fresh with glass

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR56-1	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 22x16x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, strongly vesicular 40-50% <4mm, mostly open but also sediment filled varieties 6. Phenocrysts: Plg 30% <7mm fresh to weakly altered; few Ol <1% <1mm fresh 7. Matrix: fine grained 9. Encrustations: weak Mn coating, minor glassy rim 3mm, phenocryts within glass rim 10. Comment: representative for most recovered material of this dredge. samples differ in phenocryst abundance and vesicularity. All have fairly large and abundand Plg phenocrysts; high vesicularity is also noticeable.	x_air freight box	x	2	GL			GNS	
SO255-DR56-2	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 34x22x21cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, highly vesicular 40% <3mm, mostly open but partly filled with sediment 6. Phenocrysts: Plg 30% <8mm fresh to weakly altered; few Ol <1% <2mm fresh 7. Matrix: fine grained 9. Encrustations: weak Mn coating, minor glassy rim 3mm	x_air freight box	x	1-2	GL			GNS	
SO255-DR56-3	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 22x13x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, strongly vesicular 30% >1mm, mostly open, few filled with soft sediment 6. Phenocrysts: Fsp 30% <4mm fresh often occuring along with smaller Ol <1%. Only a single Ol observed <1mm; xenocrystic? 7. Matrix: fine grained 8. Secondary Minerals: none 9. Encrustations: thin veneer of Mn crust	x_air freight box	x	2	GL				
SO255-DR56-4	1. Rock Type: volcanic rock, fresh lava 2. Size: 16x14x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, highly vesicular 30-40% <3mm, open 6. Phenocrysts: Fsp 30% <5mm; fairly fresh Ol <1mm, <1% 7. Matrix: fine grained 10. Comment: looks similar to -1 through -3 but slightl less Fsp phyric								

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR56-5	1. Rock Type: volcanic rock, fresh lava 2. Size: 12x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: less porphyritic than -1, vesicularity 20-30% <1.5mm, open 6. Phenocrysts: Fsp <5mm; minor Ol <1.5mm 7. Matrix: fine grained 10. Comment: similar to -1 through 4 but less vesicular and less porphyritic	missing?	x		x			GNS	
SO255-DR56-6	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 13x11x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, similar to -5; strongly vesicular 40%, mainly <1mm ø, some up to 3mm ø, open 6. Phenocrysts: Fsp 20%; Ol <1% <1mm ø 7. Matrix: fine grained 10. Comment: similar to -5 but with vesicle zonation	x_air freight box	x		x				
SO255-DR56-7	1. Rock Type: volcanic, fresh pillow lava 2. Size: 27x21x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, vesicularity 30%, <2mm ø, open 6. Phenocrysts: Fsp 20% <5mm ø; minor togeher with Fsp; xenocrystic 7. Matrix: fine grained 10. Comment: fresh rock, less porphyritic	x	x		x				
SO255-DR56-8	1. Rock Type: volcanic, fresh 2. Size: 9x7x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, vesicules <3mm ø 6. Phenocrysts: Fsp 5% <2mm; Ol <1% <1mm ø 7. Matrix: fine grained 10. Comment: slightly altered Fsp, "shield margin structure"	x							
SO255-DR56-9	1. Rock Type: volcanic, fresh 2. Size: 17x10x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, vesicles <3mm ø, 25-30% 6. Phenocrysts: Fsp 10% <5mm; Ol <2% <3mm ø 7. Matrix: fine grained	x	x					GNS	
SO255-DR56-10	1. Rock Type: volcanic, pillow lava fresh 2. Size: 30x22x20cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, vesicles 25% <2mm 6. Phenocrysts: Fsp 7% <5mm 7. Matrix: fine grained 10. Comment: fresh glass similar to -9	x_air freight box	x		GL			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR56-11	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 18x12x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, vesicularity 40-50%, <1mm ø, some up to 3mm ø, open 6. Phenocrysts: Fsp 2-3% <3mm 7. Matrix: fine grained 10. Comment: slightly altered surface, foamy, highly vesicular	x	x					GNS	
SO255-DR56-12	1. Rock Type: volcanic clast, fresh 2. Size: 18x10x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyritic, vesicules 15-20%, <5mm ø 6. Phenocrysts: Fsp 5% <7mm 7. Matrix: fine grained 10. Comment: agglumeration of clasts, slightly altered rim, vesicles mainly in clusters								
SO255-DR56-13	1. Rock Type: volcanic 2. Size: 13x10x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, vesicles 40-50%, 2-3mm ø 6. Phenocrysts: Fsp 3% <3mm; Ol <1% <1mm ø 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: foamy, highly vesicular, similar to -11								
SO255-DR56-14	1. Rock Type: volcanic, slightly altered 2. Size: 12x8x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, vesicles <3mm ~10%, filled with secondary minerals 6. Phenocrysts: Fsp 10-15%; Px ~7% <2mm ø, altered black minerals 7. Matrix: very fine grained 8. Secondary Minerals: vesicles filled with white / beige material 10. Comment: different to all other samples, desnser and more altered	x							

SO255-NET57

Description of Location and Structure: Kermadec Volcanic Front, Giggenbach Volcanic Field, cone N of large central cone

Net off deck UTC 17/03/17 15:30hrs, lat 29 56.70'S, long 178 43.82'W, depth 916m

Net on deck UTC 17/03/17 15:43hrs, lat 29 56.709'S, long 178 43,82'W, depth 694m

max water depth: 200m, hieve 0.7m/s

SO255-DR58

Description of Location and Structure: Kermadec Volcanic Front, Giggenbach Volcanic Field, cone N of large central cone. NE-SW elongated ridge-like structure, rift zone? Track along NW flank beneath summit.

Dredge on bottom UTC 17/03/17 16:27hrs, lat 29 56.72'S, long 178 43.79'W, depth 874m

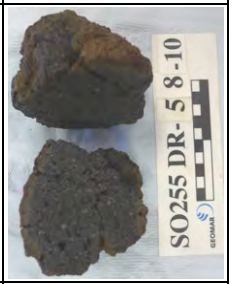
Dredge off bottom UTC 17/03/17 17:44hrs, lat 29 56.97'S, long 178 43,40'W, depth 639m

total volume: 1/2 full

Comments: heterolithological volcanics ranging from highly porphyric Px > Fsp (e.g. -1 to -6), Fsp > Px (-9 to -10) over Fsp-Px in equal amounts (-11 to -14) to near aphyric lava (-15 to -18). Mafic and silicic pumice of local origin?. -30 is a plutonic rock, leucocratic gabbro?

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR58-1	1. Rock Type: volcanic, fresh lava, basalt 2. Size: 18x13x17cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyric, vesicularity 15% <10mm 6. Phenocrysts: Fsp 7% <3mm; Px 25% <5mm; xenocrystic? Ol <1% 7. Matrix: fine grained 10. Comment: fairly heavy rock, glomerocrystic texture	x_air freight box	x					GNS	
SO255-DR58-2	1. Rock Type: volcanic, fresh lava 2. Size: 17x9x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyric, vesicularity 25% <5mm 6. Phenocrysts: Fsp 10% <3mm; Px 25% <5mm; Ol <1%, black dots altered Px? 7. Matrix: fine grained 10. Comment: fresh, heavy rock similar to -1	x_air freight box	x					GNS	
SO255-DR58-3	1. Rock Type: volcanic, fresh lava, basalt 2. Size: 14x15x19cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyric, vesicularity <20% <1.5cm 6. Phenocrysts: Fsp 10% <3mm; Px 25% <5mm; xenocrystic? Ol <1% 7. Matrix: fine grained 10. Comment: fresh heavy rock, similar to -1 and -2	x_air freight box	x					GNS	
SO255-DR58-4	1. Rock Type: volcanic, fresh lava, basalt 2. Size: 18x10x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: porphyric, vesicularity 20% <5mm 6. Phenocrysts: Fsp ~10-15% ~2mm; Px 15-20% <2mm; Ol <1mm ~2% 7. Matrix: fine grained 10. Comment: similar to -1 and -2 but smaller crystals and vesicles	x	x					GNS	
SO255-DR58-5	1. Rock Type: volcanic, fresh lava, basalt 2. Size: 17x14x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicularity 20-25% <5mm 6. Phenocrysts: Fsp 10-15% ~5mm; Px 20-25% <3mm; Ol <5% <1mm 7. Matrix: fine grained 10. Comment: heavy rock, similar to -1 through -4	x							

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR58-6	1. Rock Type: volcanic, fresh lava, basalt 2. Size: 15x15x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicularity 20% <15mm 6. Phenocrysts: Fsp 10-15% <5mm; Px 25% <5mm; Ol <1% <1mm 7. Matrix: fine grained	x							
SO255-DR58-7	1. Rock Type: volcanic, fresh lava 2. Size: 22x17x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicularity 15% <4mm 6. Phenocrysts: Fsp 20-25% <4mm; Px 10-15% <2mm; Ol <5% <1mm 7. Matrix: fine grained: 10. Comment: smaller crystals than in -1 through -6, heavy rock	x_air freight box	x					GNS	
SO255-DR58-8	1. Rock Type: volcanic, fresh lava 2. Size: 15x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark-grey 5. Texture / Vesicularity: vesicularity 10-15% <3mm 6. Phenocrysts: Plg 20% <5mm; Px 10-15% <3mm; Ol <1% <1mm? 7. Matrix: fine grained 10. Comment: similar to -7, heavy rock	x_air freight box	x					GNS	
SO255-DR58-9	1. Rock Type: volcanic, fresh lava, basalt 2. Size: 16x14x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicularity 10-15% <2mm on average some up to 3cm 6. Phenocrysts: Fsp 15-20% <3mm, some have brownish core (altered?), most clear to white; Px <10% greenish up to 3mm 7. Matrix: fine grained 9. Encrustations: alteration rim <4mm, no glass 10. Comment: heavy rock	x_air freight box	x					GNS	
SO255-DR58-10	1. Rock Type: volcanic, slightly altered 2. Size: 13x8.5x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicularity 15-20% <5mm 6. Phenocrysts: Fsp 15-20% <3mm; Px <10% <2mm 7. Matrix: fine grained 10. Comment: similar to -9, heavy rock								
SO255-DR58-11	1. Rock Type: volcanic, mafic pumice 2. Size: 16x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% <3mm, some up to 8mm 6. Phenocrysts: Fsp 10-15% <3mm; Px 15% <4mm 7. Matrix: fine grained	x	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR58-12	1. Rock Type: volcanic, fresh lava 2. Size: 10x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicularity 15% <1mm on ø, some up to 3mm 6. Phenocrysts: Fsp 15% <4mm; Px 10% <7mm; Ol <1% 7. Matrix: fine grained	x	x						
SO255-DR58-13	1. Rock Type: volcanic, altered 2. Size: 9x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 10-15% <4mm, mostly 1mm ø 6. Phenocrysts: Fsp <10% <3mm; Px ~10% <2mm 7. Matrix: fine grained 10. Comment: two types of lava stages, some Fsp is altered							GNS	
SO255-DR58-14	1. Rock Type: volcanic, altered 2. Size: 13.5x10x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicularity 20% <2mm 6. Phenocrysts: Fsp ~10% <4mm; Px ~15% <5mm 7. Matrix: fine grained 9. Encrustations: alteration halo <5mm								
SO255-DR58-15	1. Rock Type: volcanic, fresh lava 2. Size: 14x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: near aphyric, vesicles 5% 1cm elongated 6. Phenocrysts: Fsp 1%; Px 1%? 7. Matrix: fine grained	x_air freight box	x					GNS	
SO255-DR58-16	1. Rock Type: volcanic, fresh lava 2. Size: 9x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: near aphyric, vesicularity 15% <4mm 6. Phenocrysts: Fsp 1%; Px 1%? 7. Matrix: fine grained 10. Comment: similar to -15	x_air freight box	x					GNS	
SO255-DR58-17	1. Rock Type: volcanic, fresh lava 2. Size: 9x6.5x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicularity 7% 0.3mm 6. Phenocrysts: Fsp 2% 7. Matrix: fine grained	x	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR58-18	1. Rock Type: volcanic, altered 2. Size: 9x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Fsp 2%; Px 7% 7. Matrix: fine grained 10. Comment: contains fragments of other lavas	x	x					GNS	
SO255-DR58-19	1. Rock Type: volcanic, altered 2. Size: 11x9x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles <1mm along veins / fractures 6. Phenocrysts: altered Px 15-20% <2mm 7. Matrix: fine grained 10. Comment: fairly heavy rock, glomerocrystic texture							GNS	
SO255-DR58-20	1. Rock Type: volcanic, mafic pumice 2. Size: 12x9x4.5cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% <4mm 6. Phenocrysts: Fsp 5-10% <4mm; Px 3% <3mm 7. Matrix: fine grained 10. Comment: kind of a flow structure visible; two types of lava, similar to -11								
SO255-DR58-21	1. Rock Type: volcanic, mafic pumice, altered 2. Size: 8x7x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey to brownish ---> flow structure 5. Texture / Vesicularity: porphyric, vesicles 20% <3mm 6. Phenocrysts: Px <10% <2mm; Fsp? 7. Matrix: fine grained 10. Comment: two types of melt, most crystals in the black part								
SO255-DR58-22	1. Rock Type: volcanic 2. Size: 8x7x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 25-30% <5mm 6. Phenocrysts: Fsp 15-20% <3mm; Px 10% <2mm 7. Matrix: fine grained							GNS	
SO255-DR58-23	1. Rock Type: volcanic, pumice 2. Size: a) 9x18.5x9cm; b) 7x6x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 17% <5mm 6. Phenocrysts: Fsp 2% 7. Matrix: fine grained 10. Comment: basalt fragments, volcaniclastics brown	x						GNS, UTAS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR58-24	1. Rock Type: volcanic, pumice, mafic, dacitic 2. Size: 10x7.5x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black - light grey 5. Texture / Vesicularity: mafic part porphyric, vesicles 8% <6mm, dacitic part aphyric 6. Phenocrysts: mafic part Fsp 3%; Px 1%, dacitic part Cpx 3%? 7. Matrix: fine grained 10. Comment: mostly mafic pumice, 1/4 dacitic pumice	x							
SO255-DR58-25	1. Rock Type: volcanic, pumice, slightly altered 2. Size: 15x14x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, vesicles on surface 5% 7. Matrix: medium grained 10. Comment: vesicles only on surface, glassy crystalline, no fragments inside, differs from the other pumice	x	x					GNS	
SO255-DR58-26	1. Rock Type: volcanic, pumice, two different types 2. Size: a) 13x12x10cm, b) 6x5.5x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey to grey 5. Texture / Vesicularity: aphyric & porphyric on the top 7. Matrix: fine grained 10. Comment: on the top more vesicles and volcanic fragments (lava), some with Ol							UTAS	
SO255-DR58-27	1. Rock Type: volcanic, pumiceous 2. Size: 13x11.5x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: vesicles 25-30% <5mm, crystalline 6. Phenocrysts: 20% mafic minerals <1mm, Qtz; rest glass 7. Matrix: coarse grained 9. Encrustations:slightly altered; some cracks and vesicles filled with soft mud; some brownish stains 10. Comment: crystal mush (Qtz + Fsp) with glass; probably same chemistry compared to fine pumice								
SO255-DR58-28	1. Rock Type: volcanic, pumiceous, slightly more dense than typical pumice 2. Size: 11x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey, crystalline, glass 5. Texture / Vesicularity: vesicles ~15% up to 5mm 6. Phenocrysts: Qtz, mafic minerals <1%, Fsp 7. Matrix: medium to coarse grained 9. Encrustations: some alteration stains on surface 10. Comment: less crystalline than -27, more vesicular								
SO255-DR58-29	1. Rock Type: volcanic, highly altered; but fresh core 2. Size: 12x9x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey core, light grey rim with brown vesicle infill 5. Texture / Vesicularity: vesicularity 15%, most vesicles in 3cm altertion halo partially filled with brown material / coating 6. Phenocrysts: holocrystalline, mainly Fsp & Qtz + metallic vesicle infill 7. Matrix: medium to coarse grained 8. Secondary Minerals: brown stains; metallic bearing 10. Comment: heavy rock, maybe hydrothermally altered							GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR58-30	1. Rock Type: plutonic, gabbro?, partly altered 2. Size: 13x5x12cm 3. Shape / Angularity: angular 4. Color of cut surface: grey with light grey speckles 5. Texture / Vesicularity: holocrystalline 6. Phenocrysts: mainly Fsp; Qtz?; black minerals (Amph?) 7. Matrix: medium coarse grained, variable througout sample 8. Secondary Minerals: some Fe bearing minerals, brownish altered 10. Comment: looks like plutonic counterpart of the more pumiceous crystal rich samples -25	x							
SO255-DR58-31	1. Rock Type: volcaniclastic 2. Size: 10x7x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: multi colored; dark grey-grey-light grey, brown 5. Texture / Vesicularity: lava + plutonic altered fragments up to 9mm ø 6. Phenocrysts: difficult to discern; mostly altered 7. Matrix: fine grained matrix containing up to 9mm ø fragments 10. Comment: could be used for geochem but requires very careful, time consuming preparation								
SO255-DR58-32	1. Rock Type: volcaniclastic 2. Size: 12x7x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: multi colored; mainly dark grey 5. Texture / Vesicularity: altered lava fragments 6. Phenocrysts: some Fsp in fragments 7. Matrix: fine grained matrix cementing lava fragments <2cm 10. Comment: usability is quationable, but some clasts ok for HFSE	x	x						
SO255-DR58-33	1. Rock Type: volcanic 2. Size: 9x6x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey - dark grey 5. Texture / Vesicularity: porphyric, vesicularity 10% <2mm 6. Phenocrysts: Fsp 2-3% <2mm; Px 1% <1.5mm; Ol 1-2% <1mm 7. Matrix: fine grained 10. Comment: seems like older lava ---> volcano basement, Fsp potentially datable	x							
SO255-DR58-34	1. Rock Type: altered, reddish lava 2. Size: 12x9x3.5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey - brown - reddish 5. Texture / Vesicularity: altered lava fragment, fractured 6. Phenocrysts: Fsp 2-3% <2mm altered 7. Matrix: fine grained matrix 8. Secondary Minerals: rock oxidized 9. Encrustations: <1mm Mn oxide 10. Comment: dense probably older lava, difficult to use for geochemistry								

SO255-DR59

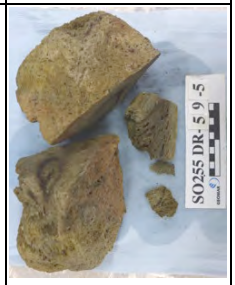
Description of Location and Structure: Kermadec Volcanic Front, Giggenbach Volcanic Field. Giggenbach volcano; largest volcano of the field, upper NW slope

Dredge on bottom UTC 17/03/17 19:10hrs, lat 30 1.02'S, long 178 43.23'W, depth 590m

Dredge off bottom UTC 17/03/17 20:45hrs, lat 30 1.38'S, long 178 43,00'W, depth 244m

total volume: full

Comments: pumice only

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR59-1	1. Rock Type: volcanic, pumice, altered 2. Size: 12x17x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, beige-grey, black-grey core 5. Texture / Vesicularity: porous, glassy, strongly vesicular 50%, phenocrysts 6. Phenocrysts: felsic Fsp?; mafic Px, mineral grains 6mm 20%, mafic are larger in amount and size 7. Matrix: porous glassy matrix 10. Comment: altered core (black core), probably also Qtz phenocrysts!, sample -1 through -4 are very similar	x						GNS	
SO255-DR59-2	1. Rock Type: volcanic, pumice, altered 2. Size: 12x13x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, beige-grey, black core, brown 5. Texture / Vesicularity: porous, glassy, strongly vesicular 40%, phenocrysts 6. Phenocrysts: felsic Fsp; mafic Px, mineral grains 4mm 20% 7. Matrix: porous glassy matrix 10. Comment: altered core black core	x							
SO255-DR59-3	1. Rock Type: volcanic, pumice, altered 2. Size: 10x9x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, beige-grey, part of rim is black colored 5. Texture / Vesicularity: porous, glassy, strongly vesicular 50%, phenocrysts 6. Phenocrysts: felsic Fsp Qtz; mafic Px, mineral grains 4mm 15% 7. Matrix: porous glassy matrix 10. Comment: altered outer rim	x							
SO255-DR59-4	1. Rock Type: volcanic, pumice, altered 2. Size: 17x14x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, beige-grey, black core 5. Texture / Vesicularity: porous, glassy, strongly vesicular 40%, phenocrysts 6. Phenocrysts: felsic Fsp; mafic Px, mineral grains 4mm 15% 7. Matrix: porous glassy matrix	x							
SO255-DR59-5	1. Rock Type: volcanic, pumice, moderately altered 2. Size: 23x12x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, beige-grey 5. Texture / Vesicularity: porous, glassy, strongly vesicular 50%, phenocrysts, some large vesicles and phenocrysts up to 1cm 6. Phenocrysts: felsic Fsp; mafic Px, mineral grains <10mm 10%, 7. Matrix: porous glassy matrix							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR59-6A, -6B	1. Rock Type: volcanic, pumice, altered 2. Size: A) 6x5x4cm, B: 6x4x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: A: grey, B: dark grey 5. Texture / Vesicularity: porous, glassy, moderate vesicular 30%, <8mm, phenocrysts 6. Phenocrysts: felsic Fsp; mafic Px, mineral grains 20%, <3mm 7. Matrix: porous glassy matrix 10. Comment: two separate pieces, B is less vesicular and darker than A								
SO255-DR59-7	1. Rock Type: volcanic, pumice, altered 2. Size: 14x12x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, grey 5. Texture / Vesicularity: porous, glassy, strongly vesicular 40%, <8mm; phenocrysts 6. Phenocrysts: felsic Fsp; mafic Px, mineral grains 7. Matrix: porous glassy matrix	x							
SO255-DR59-8	1. Rock Type: volcanic, pumice, weakly altered 2. Size: 18x13x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, grey 5. Texture / Vesicularity: porous, glassy, strongly vesicular 50%, <1cm; phenocrysts 6. Phenocrysts: felsic Fsp; mafic Px, mineral grains 7. Matrix: porous glassy matrix 10. Comment: brownish altration rim, black volcanic fragments within matrix							GNS	
SO255-DR59-9	1. Rock Type: volcanic, pumice, altered 2. Size: 11x9x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey to orange 5. Texture / Vesicularity: porous, glassy, strongly vesicular 40%, phenocrysts 6. Phenocrysts: felsic Fsp; mafic Px, mineral grains up to 3mm ~15% 7. Matrix: porous glassy matrix								
SO255-DR59-10	1. Rock Type: volcanic, pumice, altered 2. Size: 8.5x5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey to orange 5. Texture / Vesicularity: porous, glassy, strongly vesicular 50%, phenocrysts 6. Phenocrysts: felsic Fsp; mafic Px, mineral grains up to 7mm ~15% 7. Matrix: porous glassy matrix								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR59-11A, -11B	1. Rock Type: volcanic, pumice, altered 2. Size: A: 12x7x2cm; B: 10x9x2cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porous, glassy, vesicular 30%, phenocrysts 6. Phenocrysts: small felsic Fsp up to 2mm; mafic Px up to 5mm 15-20% 7. Matrix: porous glassy matrix 10. Comment: samples seem to be compacted, compared to -10 there is a higher amount of mafic minerals, two separate sample pieces	2x							
SO255-DR59-12	1. Rock Type: volcanic, pumice, altered 2. Size: 21x10x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale greyish 5. Texture / Vesicularity: porous, glassy, strongly vesicular 40%, phenocrysts 6. Phenocrysts: mafic Px up to 4mm, 20% felsic Fsp sub-mm 7. Matrix: porous glassy matrix 10. Comment: some parts have an orange alteration on the outside								

SO255-DR60

Description of Location and Structure: Kermadec Volcanic Front, Giggenbach Volcanic Field. Giggenbach volcano; southernmost cone along a small valley at the NW flank of the cone

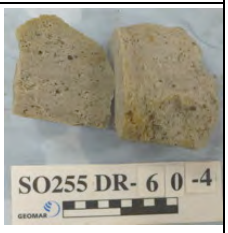
Dredge on bottom UTC 17/03/17 22:20hrs, lat 30 5.60'S, long 178 45.09'W, depth 783m

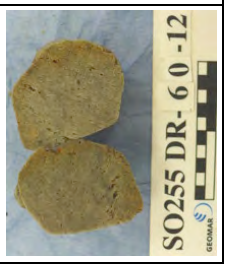
Dredge off bottom UTC 17/03/17 23:24hrs, lat 30 5.84'S, long 178 44,84'W, depth 244m

total volume: 1/4 fiull

Comments: pumice only

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR60-1	1. Rock Type: volcanic, pumice, fresh 2. Size: 26x22x27cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, light grey 5. Texture / Vesicularity: porous, glassy, moderate vesicular 20%, <5mm, phenocrysts 6. Phenocrysts: mafic mineral grains Px black + green, grains and needle like, 20%, <5mm 7. Matrix: porous glassy 10. Comment: volcanic fragments (black, ~1cm) within matrix	x	x					GNS	
SO255-DR60-2	1. Rock Type: volcanic, pumice, fresh 2. Size: 24x20x16cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, light grey 5. Texture / Vesicularity: porous, glassy, moderate vesicular 15-20%, <5mm, phenocrysts 6. Phenocrysts: mafic phenocrysts Px 10-15% <2mm needle like, volcanic fragments black <1cm, vesicular 7. Matrix: porous glassy								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR60-3	1. Rock Type: volcanic, pumice, fresh 2. Size: 17x13x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, light grey - white 5. Texture / Vesicularity: porous, glassy, moderate vesicular 15-20%, <6mm, phenocrysts 6. Phenocrysts: Px 5% <1mm, black volcanic fragments <3mm 7. Matrix: porous glassy	x	x					GNS	
SO255-DR60-4	1. Rock Type: volcanic, pumice, fresh 2. Size: 13x9x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey - white 5. Texture / Vesicularity: porous, glassy, vesicularity 20%, <6mm, uneven vesicle distribution 6. Phenocrysts: black volcanic fragments 5% <3mm 7. Matrix: porous glassy								
SO255-DR60-5	1. Rock Type: volcanic, pumice, fresh 2. Size: 10x10x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, light grey - white 5. Texture / Vesicularity: porous, glassy, strongly vesicular 30%, <8mm 6. Phenocrysts:black volcanic clasts 5% <5mm, Px needles 1% <1mm 7. Matrix: porous glassy	x with clast						GNS	
SO255-DR60-6	1. Rock Type: volcanic, pumice, fresh 2. Size: 14x8x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, light grey - white 5. Texture / Vesicularity: porous, glassy, strongly vesicular 50%, 2cm, large holes 6. Phenocrysts: black volcanic clasts 5% <5mm, Px <1% <1mm 7. Matrix: porous glassy								
SO255-DR60-7	1. Rock Type: volcanic, pumice, weakly altered 2. Size: 18x16x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey with black lineation 5. Texture / Vesicularity: porous, glassy, compressed, weakly vesicular 10%, <5mm, lineated 6. Phenocrysts: black volcanic clasts 1% <3mm, Px <1%, <2mm 7. Matrix: glassy, porous 10. Comment: thin lineated horizons of black matrix <5mm thick								
SO255-DR60-8	1. Rock Type: volcanic, pumice, fresh 2. Size: 26x22x27cm 3. Shape / Angularity: subrounded 4. Color of cut surface: pale, light grey 5. Texture / Vesicularity: porous, glassy, moderate vesicular 20%, <5mm, phenocrysts 6. Phenocrysts: mafic mineral grains Px black + green, grains and needle like, 20%, <5mm 7. Matrix: porous glassy 10. Comment: volcanic fragments (black, ~1cm) within matrix	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR60-9	1. Rock Type: volcanic, pumice, altered 2. Size: 11x7x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, darker grey lines 5. Texture / Vesicularity: porous, glassy, vesicularity 10%, <2mm 6. Phenocrysts: black Px needles <2mm, 1-2% black volcanic debris <1% <1mm 7. Matrix: porous glassy	x						GNS	
SO255-DR60-10	1. Rock Type: volcanic, pumice, altered 2. Size: 12x11x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porous, glassy, vesicularity 10%, <4mm, phenocrysts 6. Phenocrysts: small volc., black <1% <2mm 7. Matrix: porous glassy								
SO255-DR60-11	1. Rock Type: volcanic, pumice, altered 2. Size: 11x7x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, dark grey lines 5. Texture / Vesicularity: porous, glassy, vesicularity 30%, <1cm 6. Phenocrysts: black Px needles <0.1mm, <1% 7. Matrix: porous glassy, black volc. debris <4mm 3%: 10. Comment: vesicles filled with sediment near margin of sample								
SO255-DR60-12	1. Rock Type: volcanic, pumice, altered 2. Size: 11x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porous, glassy, vesicularity 15%, <3mm , black volcanic debris embedded, 5% <3mm 6. Phenocrysts: black Px needles <0.1mm <1% 7. Matrix: porous glassy								

SO255-EM61

EM122 & Parasound profiling across Havre, then along E-side of Colville and then across Havre towards E till Kermadec Ridge

SO255-DR62

Description of Location and Structure: Kermadec Ridge, northern section of working area. Small W facing step on the crest of the ridge

Dredge on bottom UTC 19/03/17 03:08hrs, lat 28 26.49'S, long 177 39.41'W, depth 1512m

Dredge off bottom UTC 19/03/17 04:19hrs, lat 28 26.84'S, long 177 39,15'W, depth 1161m

total volume: 1/6 full

Comments: volcaniclastics and lava, safety cable wrapped around chain bag. -1 to -4 fairly fresh highly Plg phyric lava, -5 less phyric Plg lava, -6 & -7 dense aphyric lava

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR62-1	1. Rock Type: volcanic, slightly altered basalt 2. Size: 20x15x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: pophyric, vesicles 30-40% <4mm 6. Phenocrysts: Plg 15-20% <4mm 7. Matrix: fine granular 9. Encrustations: <1mm Mn crust, <8mm sediment / conglomerate crust 10. Comment: fresh Plg, glass rim	x_air freight box	x		GL slab		GC in air-freight box	GNS	
SO255-DR62-2	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 14x10x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey to black 5. Texture / Vesicularity: pophyric, vesicles 30-40% <2mm 6. Phenocrysts: Plg 20% <4mm 7. Matrix: fine grained 9. Encrustations: <1cm rim of sediments / conglomerate; <1mm Mn crust 10. Comment: fresh Plg	2x, margin and center	x		GL slab		GC in air-freight box		
SO255-DR62-3	1. Rock Type: volcanic, basalt 2. Size: 19x16x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: pophyric, vesicles 20% <2mm 6. Phenocrysts: Plg 10-15% <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust, <1cm rim of sediment / conglomerate 10. Comment: fresh Plg	x	x					GNS	
SO255-DR62-4	1. Rock Type: volcanic, slightly altered basalt 2. Size: 14x10x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: pophyric, vesicles 20% <2mm 6. Phenocrysts: Plg 10-15% <4mm 7. Matrix: fine granular 8. Secondary Minerals: 9. Encrustations: <1mm Mn crust								
SO255-DR62-5	1. Rock Type: volcanic, basalt 2. Size: 14x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% <4mm 6. Phenocrysts: Plg 5% 7. Matrix: fine grained 9. Encrustations: brown matrix with entrained pieces of basalt 10. Comment: minerals, very faint, difficult to distinguish	x	x					GNS	

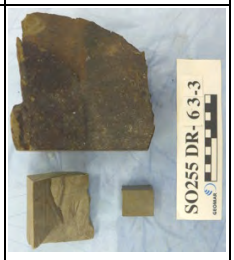
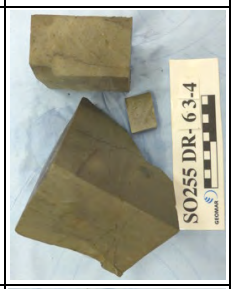
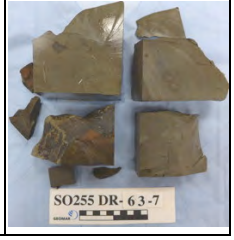
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR62-6	1. Rock Type: volcanic, andesite? 2. Size: 11x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: aphyric, 1mm lines of vesicles across rock 7. Matrix: very fine grained 9. Encrustations: 12mm red brown matrix with bsack and grey clasts up to 6mm	x	x					GNS	
SO255-DR62-7	1. Rock Type: volcanic, andesite? 2. Size: 11x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: aphyric, dense 7. Matrix: fine grained 9. Encrustations: 5mm red brown matrix with entrained black & grey clasts up to 6mm								
SO255-DR62-8	1. Rock Type: volcanic, consolidated fallout deposit 2. Size: 40x30x25cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: up to 2mm black clasts 7. Matrix: coarse								

SO255-DR63

Description of Location and Structure: Volcanic cone structure on Kermadec Ridge; lower flank

Dredge on bottom UTC 19/03/17 08:08hrs, lat 28 7.39'S, long 177 43.95'W, depth 2204m
Dredge off bottom UTC 19/03/17 09:35hrs, lat 28 7.70'S, long 177 43,63'W, depth 1770m
total volume: 1/4 full
Comments: highly altered lava with variable amounts of Plg and Px. Requires TS work to identify similarities and commons in alteration and minerlal content

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR63-1	1. Rock Type: volcanic, highly altered 2. Size: 21x10x7cm original size of block M, 15x10x6cm working half 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: glomerophyric, 5-10% vesicles <1mm 6. Phenocrysts: Plg 10% <2mm altered, minerals with metallic shimmer<3% <1mm magnetite?; Px 10% <2mm; Iddingsite 5% <1mm 7. Matrix: fine grained 10. Comment: slightly magnetic ---> Fe minerals	x_air freight box	x				GC in air-freight box	GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR63-2	1. Rock Type: volcanic, highly altered 2. Size: 35x18x11cm original size of block T, 17x10x9cm working half 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: glomerophyric, 5% vesicles <1mm 6. Phenocrysts: Plg 15% <2mm altered, magnetite?; Iddingsite ~5% <1mm; Px <2mm 7. Matrix: fine grained 10. Comment: similar to -1	x_air freight box	x					GNS	
SO255-DR63-3	1. Rock Type: volcanic, highly altered 2. Size: 40x26x15cm original size of block C, 21x13x8cm working half 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyritic, 5% vesicles <1mm 6. Phenocrysts: Iddingsite 3% <1mm; MT <3% <1mm; Plg 10% <2mm; Amph <3% ~3mm; Px 5-10% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR63-4	1. Rock Type: volcanic, highly altered 2. Size: 33x17x11cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey - green 5. Texture / Vesicularity: porphyritic, 5% vesicles <1mm 6. Phenocrysts: Iddingsite 3% <1mm; Plg 15% <2mm; MT? <1mm; Px 15-20% 1-2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR63-5	1. Rock Type: volcanic, highly altered 2. Size: 13x12x8cm 3. Shape / Angularity: angular 4. Color of cut surface: medium grey to dark grey 5. Texture / Vesicularity: glomerophyric, 3-5% vesicles <1mm 6. Phenocrysts: MT? <5% <1mm; Plg ~10% <3mm; Iddingsite <3% ~1mm; Px 10-15% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: simlar to -1 and -2	x	x					GNS	
SO255-DR63-6	1. Rock Type: volcanic, highly altered 2. Size: 21x18x13cm original size of block M, 15x10x6cm working half 3. Shape / Angularity: angular 4. Color of cut surface: medium grey 5. Texture / Vesicularity: glomerophyric, 3% vesicles <1mm 6. Phenocrysts: <5% Mt?; Plg 15% <2mm; Px 15% <1mm 7. Matrix: fine grained 8. Secondary Minerals: some veins 9. Encrustations: <1mm Mn crust 10. Comment: similar to -1 and -2	x	x						
SO255-DR63-7	1. Rock Type: volcanic, highly altered 2. Size: 20x19x8cm 3. Shape / Angularity: angular 4. Color of cut surface: medium grey to greenish 5. Texture / Vesicularity: porphyric, 3% vesicles <1mm 6. Phenocrysts:Iddingsite 3% <2mm; MT? <3%; Px 15% <2mm; Plg 10% <2mm 7. Matrix: fine grained	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR63-8	1. Rock Type: volcanic, core fresh, rim slightly altered 2. Size: 20x18x10cm 3. Shape / Angularity: angular 4. Color of cut surface: crore light grey; rim green 5. Texture / Vesicularity: porphyritic, 0% vesicles 6. Phenocrysts: 25% mafic minerals (Px or Amph) 1-3mm; 15% Plg <2mm; MT <1mm 7. Matrix: medium grained 8. Secondary Minerals: vein 9. Encrustations: <1mm Mn crust								
SO255-DR63-9	1. Rock Type: sedimentary 2. Size: 10x9x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: overall dark green 5. Texture / Vesicularity: small pebbles 6. Phenocrysts: max 1cm clasts 7. Matrix: fine to medium grained 9. Encrustations: <1mm Mn crust								
SO255-DR63-10	1. Rock Type: sedimentary rock 2. Size: 10x9x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: overall dark green 5. Texture / Vesicularity: small pebbles 6. Phenocrysts: max 1.5cm clasts 7. Matrix: fine to medium grained 9. Encrustations: <1mm Mn crust 10. Comment: similar to -9							GNS	

SO255-DR64

Description of Location and Structure: Eastern part of Havre Trough; lower flank of major scrap

Dredge on bottom UTC 19/03/17 13:34hrs, lat 28 22.04'S, long 177 57.57'W, depth 1921m

Dredge off bottom UTC 19/03/17 14:33hrs, lat 28 22.31'S, long 177 57,46'W, depth 1646m

total volume: 1/3 full

Comments: heterogeneous lava fragments ranging from variably phyric Px-Fsp (-1 to -7), Ol phyric (-8, -10) to aphyric (-9). All lavas are rel. fresh but should be reinspected for commons and differences as sample no distribution does not necessarily correlate with petrogtraphic observations made during sample description.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR64-1	1. Rock Type: volcanic, andesite 2. Size: 13x11x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px 5% <3mm, Plg with Px specks 1%? 7. Matrix: fine grained	x_air freight box	x					GNS	
SO255-DR64-2	1. Rock Type: volcanic, andesite 2. Size: 8x7x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: glomerophyric, 5% vesicles 6. Phenocrysts: Plg 15% 2mm; Px 10% <2mm, MT? <5%? 7. Matrix: fine grained 10. Comment: similar to -1	x_air freight box	x				GC in air-freight box		

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR64-3	1. Rock Type: volcanic, basaltic andesite 2. Size: 8x7x7cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px 3% <2mm, Plg with Px specks 1%? 7. Matrix: fine grained 10. Comment: almost glassy shiny surface	x						GNS	
SO255-DR64-4	1. Rock Type: volcanic, andesite 2. Size: 11x8x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Fsp 2% 1mm; Ol <1% 1mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 9. Encrustations: 14mm brecciated crust, rock material 9mm clasts, also blue red clasts	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR64-5	1. Rock Type: volcanic, andesite 2. Size: 16x14x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, 30% vesicles 7. Matrix: fine grained, Plg + Px	x	x					GNS	
SO255-DR64-6	1. Rock Type: volcanic, basaltic andesite 2. Size: 9x7x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: porphyric, 5% vesicles 6. Phenocrysts: Ol 5% <2mm; Px 10% <1mm; Plg 15% 2mm 7. Matrix: fine grained, Plg + Px in groundmass	x							
SO255-DR64-7	1. Rock Type: volcanic, andesite 2. Size: 10x8x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: aphyric 7. Matrix: fine grained, Plg + Px in groundmass	x_air freight box	x				GC in air-freight box		
SO255-DR64-8	1. Rock Type: volcanic, basalt, basaltic andesite 2. Size: 26x8x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 30% vesicles 6. Phenocrysts: 20% Ol <2mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x	x					GNS	
SO255-DR64-9	1. Rock Type: volcanic, basalt, basaltic andesite 2. Size: 13x10x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: aphyric, 30% vesicles 6. Phenocrysts: aphyric 7. Matrix: fine grained, Plg? in groundmass 9. Encrustations: 1mm Mn crust 10. Comment: similar to -5 and -7	x	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR64-10	1. Rock Type: volcanic, basalt 2. Size: 16x11x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: Ol 15% <2mm 7. Matrix: fine grained 10. Comment: similar to -8	x_air freight box	x					GNS	
SO255-DR64-11	1. Rock Type: volcanic, basalt, basaltic andesite 2. Size: 12x10x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic layers, 20% vesicles ~1mm 6. Phenocrysts: Fsp 10% <3mm; Px black and green 20% <3mm 7. Matrix: fine grained 10. Comment: good Fsp	x_air freight box	x	2			TS-Box 1-63	GNS	
SO255-DR64-12	1. Rock Type: volcanic, basalt, highly vesicular 2. Size: 11x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 50% vesicles in creasing in size from glassy margin ø1mm to inside ø5mm 6. Phenocrysts: Ol 5% <2mm, Px black 3% <1mm 7. Matrix: fine grained 10. Comment: thin glassy rim, glass probably altered	x	x					GNS	
SO255-DR64-13	1. Rock Type: volcanic, basalt, fresh 2. Size: 8x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, moderate vesicularity 15% <5mm, open 6. Phenocrysts: Px 15% <3mm fresh 7. Matrix: glassy 10. Comment: glassy surface	x_air freight box	x				GC in air-freight box		
SO255-DR64-14	1. Rock Type: volcanic, andesite, weakly altered to fresh 2. Size: 12x11x6cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, non vesicular 6. Phenocrysts: Fsp 20% <3mm; Px black 10% <3mm partly altered 7. Matrix: fine grained 8. Secondary Minerals: Px partly altered to greenish mineral 10. Comment: Px show glomrophyric texture	x	x	2				GNS	
SO255-DR64-15	1. Rock Type: volcanic, andesite, weakly altered to fresh 2. Size: 15x12x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, slightly vesicular <1% <2mm filled with red Fe-oxide 6. Phenocrysts: Fsp 5% <3mm, Px 1% <3mm 7. Matrix: fine grained, groundmass partly oxidized ----> red patches 8. Secondary Minerals: Fe oxide in vesicles and groundmass			3-4					

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR64-16	1. Rock Type: volcanic, andesite, moderately altered 2. Size: 11x9x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: porphyric, non vesicular ---> one vesicle filled with altered weathered material 6. Phenocrysts: Fsp 3% <2mm, Px 5% <3mm 7. Matrix: fine grained 8. Secondary Minerals: oxidized mineral grains --> MT (red mineral grains) 10. Comment: very magnetic	x_air freight box		4					
SO255-DR64-17	1. Rock Type: volcanic, basaltic, heavily altered, mafic 2. Size: 13x8x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black and red when altered 5. Texture / Vesicularity: 30-40% vesicles; 10% 2-4mm, 30% <1mm; aphyric scoria 6. Phenocrysts: Px 5% <1mm 7. Matrix: fine grained 10. Comment: magnetic	x							
SO255-DR64-18	1. Rock Type: volcanic, pumice, moderately altered 2. Size: 18x18x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, altered parst are orange brown 5. Texture / Vesicularity: highly vesicular, 50% up to 1cm, glassy matrix has few phenocrysts 6. Phenocrysts: Cpx 0.5-2mm, needle shaped, black color 7. Matrix: glassy 9. Encrustations: thin Mn coating on some parts outside							GNS	
SO255-DR64-19	1. Rock Type: sediment with individual fine grained layers 2. Size: 25x11x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, different layers have ± brownish grey colors 5. Texture / Vesicularity: five different layers; 1) fine sand with different components, 2) thin very fine grained layer with white veins, 3) fine sand layer with lense of medium sand, 4) fine grained mud layer, 5) medium sand layer 7. Matrix: each layer has different matrix 10. Comment: thin Mn encrustation							GNS	
SO255-DR64-20	1. Rock Type: volcaniclastic, polymict 2. Size: 27x17x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown, some clasts are dark grey 5. Texture / Vesicularity: polymictic, poorly sorted, dark grey clasts are basaltic? A lot of clasts are pumice fiame 7. Matrix: fine grained 8. Secondary Minerals: some fiame have alteration rims 9. Encrustations: thin Mn coating								

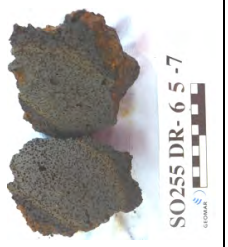
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR64-21	1. Rock Type: volcaniclastic, strongly altered, brecciated 2. Size: 16x12x10cm 3. Shape / Angularity: rounded 4. Color of cut surface: black-brown green 5. Texture / Vesicularity: brecciated, moderately vesicular, vesicle rich clasts 6. Phenocrysts: volcanic clasts of variable size containing phenocrysts: Fsp 20% <3mm altered red color in matrix; Px 10% <3mm fresh in clasts 7. Matrix: brecciated 8. Secondary Minerals: Mn within matrix? 9. Encrustations: thin Mn coating								
SO255-DR64-22	1. Rock Type: sediment, consolidated mud 2. Size: 30x14x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish green 5. Texture / Vesicularity: sandy muddy non-vesicular 7. Matrix: fine grained, sand - silt 8. Secondary Minerals: 10. Comment: mostly basaltic glass shards								
SO255-DR64-23	1. Rock Type: sediment with volcanic (basaltic) clasts 2. Size: 13x10x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: black grey 5. Texture / Vesicularity: brecciated, angular volcanic fragments ---> vesicles and phenocrysts 6. Phenocrysts: phenocrysts within volcanic clasts 9. Encrustations: Mn coating								
SO255-DR64-24A, -24B	1. Rock Type: two different rocks, volcanic altered 2. Size: 12x5x4cm, 12x5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: A: grey; B: brownish 5. Texture / Vesicularity: A: matrix supported volc. clasts, no vesicles, no phenocrysts, clasts have different shape and color. B: matrix supported small black volc. clasts 7. Matrix: fine grained								
SO255-DR64-25	1. Rock Type: volcanic 2. Size: 14x11x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark brown to grey. Layer with medium brown ellipses and lighter grey bottom layer 5. Texture / Vesicularity: three sections of lineations, fine grained then very fine grained and then fine grained ashy 7. Matrix: fine grained sediment / volcanic ash 10. Comment: bioturbation burrows ranging from 1 to 6cm, filled with very fine grained particles. Burrows oriented horizontally . One large burrow (10cm) with smaller vertical burrows inside between bottom and top layer							GNS	

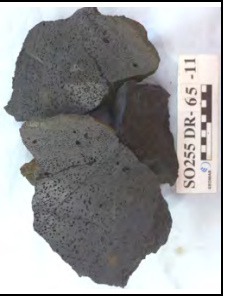
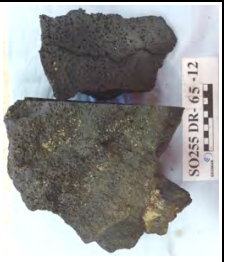
SO255-DR65

Description of Location and Structure: Eastern Havre Trough; elongated cone / ridge structure, on top of scrarp opposite of DR64

Dredge on bottom UTC 19/03/17 16:43hrs, lat 28 22.27'S, long 178 4.07'W, depth 1193m
Dredge off bottom UTC 19/03/17 17:54hrs, lat 28 22.61'S, long 178 3,94'W, depth 877m
total volume: full
Comments: abundant lava fragments including pillows with fresh glass, fairly aphyric with minor Px and Fsp phenocrysts

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR65-1	1. Rock Type: volcanic, basalt, weakly altered to fresh, pillow lava incl. fresh glass 2. Size: 13x10x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 50% <3mm open 6. Phenocrysts: very few Px <1% <1mm; Fsp? 7. Matrix: aphyric 9. Encrustations: glassy rim on both sides ~8mm, palagonite 10. Comment: sample is representative for almost entire dredge	x_air freight box	x		GL		GC in air-freight box		
SO255-DR65-2	1. Rock Type: volcanic, basalt, weakly altered to fresh 2. Size: 14x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 50% <4mm open, partly filled with sediment 6. Phenocrysts: very few Px <1% <1mm; Fsp 1% <2mm 7. Matrix: aphyric 9. Encrustations: glassy rim ~5mm, palagonite 10. Comment: similar to -1	x_air freight box	x		GL			GNS	
SO255-DR65-3	1. Rock Type: volcanic, basalt, weakly altered to fresh 2. Size: 25x19x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 50% <6mm partly filled with sediment, larger vesicles in center 6. Phenocrysts: very few Fsp ~1% <2mm 7. Matrix: aphyric 9. Encrustations: glassy rim ~10mm, palagonite 10. Comment: bigger vesicles and more abundant phenocrysts than -1 and -2	x	x	3	GL			GNS	
SO255-DR65-4	1. Rock Type: volcanic, basalt, weakly altered 2. Size: 13x12x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black - dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 40% <4mm partly filled with sediment 6. Phenocrysts: very few Fsp/Px <1% <1mm 7. Matrix: aphyric 9. Encrustations: glassy rim ~6mm, palagonite	x	x		GL			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR65-5	1. Rock Type: volcanic, basalt, fresh 2. Size: 25x22x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 40% <5mm partly filled with sediment 6. Phenocrysts: very few Px <1% <2mm 7. Matrix: aphyric 9. Encrustations: glassy rim ~10mm, palagonite	x_air freight box	x		GL		GC in air-freight box	GNS	
SO255-DR65-6	1. Rock Type: volcanic, basalt, fresh 2. Size: 18x13x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 40% <5mm partly filled with sediment 6. Phenocrysts: very few Px <1% <1mm 7. Matrix: aphyric 9. Encrustations: glassy rim ~5mm, palagonite								
SO255-DR65-7	1. Rock Type: volcanic, basalt, weakly altered 2. Size: 11x11x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 40% <5mm partly filled with brownish material; oxidized, some large vesicles >1cm 6. Phenocrysts: very few Px <1% <1mm 7. Matrix: aphyric 9. Encrustations: glassy rim ~10mm, palagonite								
SO255-DR65-8	1. Rock Type: volcanic, basalt, fresh 2. Size: 13x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 40% <5mm partly filled with sediment, some large vesicles <1cm 6. Phenocrysts: very few Px <1% <1mm 7. Matrix: aphyric 9. Encrustations: glassy rim ~8mm								
SO255-DR65-9	1. Rock Type: volcanic, basalt, fresh 2. Size: 10x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 35% <5mm 6. Phenocrysts: very few Px <1% <1mm 7. Matrix: aphyric 9. Encrustations: glassy rim ~7mm								
SO255-DR65-10A, -10B	1. Rock Type: volcanic, basalt, fresh 2. Size: A: 9x8x7cm, B:7x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 6. Phenocrysts: very few phenocrysts 7. Matrix: aphyric 9. Encrustations: A: glassy rim ~8mm, B: glassy rim ~5mm 10. Comment: -10B not shown								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR65-11	1. Rock Type: volcanic, basalt, fresh 2. Size: 38x23x22cm original size of block U 3. Shape / Angularity: subangular to angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, highly vesicular 30% <4mm, evenly distributed and shaped 6. Phenocrysts: very few Fsp <1% <1mm, Ol?? 7. Matrix: aphyric 9. Encrustations: no glassy rim	x_air freight box	x	2-3	GL		TS-Box 1-63		
SO255-DR65-12	1. Rock Type: volcanic, basalt, very fresh 2. Size: 23x18x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey - black 5. Texture / Vesicularity: aphyric, highly vesicular 40% ~6mm, even sive and distribution 6. Phenocrysts: very few Fsp / Px <1% <2mm 7. Matrix: aphyric 9. Encrustations: no glass rim ---> only filled vesicles 10. Comment: very fresh material	x_air freight box	x	2-3	GL			GNS	
SO255-DR65-13	1. Rock Type: volcanic, basalt, fresh 2. Size: 17x14x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey - black 5. Texture / Vesicularity: aphyric, highly vesicular 30% ~6mm, partly filled with sediment 6. Phenocrysts: very few Fsp / Px <1% <2mm 7. Matrix: aphyric 9. Encrustations: no glass rim 10. Comment: very similar to -12								
SO255-DR65-14	1. Rock Type: volcanic, basalt, fresh 2. Size: 16x12x10cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey black 5. Texture / Vesicularity: aphyric, highly vesicular 30% <10mm, large vesicles 6. Phenocrysts: very few Fsp <1% <1mm 7. Matrix: aphyric 9. Encrustations: no glass rim	x_air freight box	x	2-3			TS-Box 1-63		

SO255-DR66

Description of Location and Structure: small cone in Central Havre Trough, W-flank from base to top

Dredge on bottom UTC 19/03/17 20:22hrs, lat 28 20.17'S, long 178 12.34'W, depth 1784m

Dredge off bottom UTC 19/03/17 21:05hrs, lat 28 20.39'S, long 178 12,27'W, depth 1642m

total volume: very few rocks

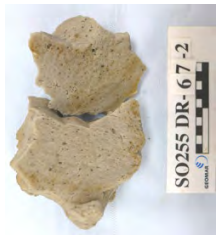
Comments: pumice only

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR66-1	1. Rock Type: volcanic, pumice altered 2. Size: 16x14x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porous, glassy; highly vesicular 40-50%; 30% 2-5mm, 20% <2mm 7. Matrix: pumiceous 10. Comment: heavily altered								

SO255-DR67

Description of Location and Structure: Havre Trough, northern profile, eastern part. Small cone along NW flank.

Dredge on bottom UTC 19/03/17 23:17hrs, lat 28 18.37'S, long 178 20,36'W, depth 1634m
Dredge off bottom UTC 20/03/17 00:36hrs, lat 28 18.80'S, long 178 20,28'W, depth 1263m
total volume: 1/4 full
Comments: pumice only

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR67-1	1. Rock Type: volcanic, pumice 2. Size: 7x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: highly porous 50% partly filled with mud glassy matrix 7. Matrix: black glassy matrix 9. Encrustations: none 10. Comment: sole dark pumice in this dredge								
SO255-DR67-2	1. Rock Type: volcanic, pumice 2. Size: 15x11x10cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: highly porous 40%, open, porphyric 6. Phenocrysts: Cpx 0.5 - 3mm, 3% 7. Matrix: black glassy matrix 9. Encrustations: none							GNS	
SO255-DR67-3	1. Rock Type: volcanic, pumice 2. Size: 14x13x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: medium grey 5. Texture / Vesicularity: highly porous 30% unfilled, porphyritic 6. Phenocrysts: Cpx 0.5-1mm 1% 7. Matrix: black glassy matrix 9. Encrustations: none 10. Comment: partly thin Mn coating							GNS	
SO255-DR67-4	1. Rock Type: volcanic, pumice 2. Size: 12x10x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: highly porous 40% unfilled, porphyritic 6. Phenocrysts: Cpx 1-2mm, 1% 7. Matrix: black glassy matrix 8. Secondary Minerals: some cracks filled with secondary minerals CC? 9. Encrustations: none							GNS	
SO255-DR67-5	1. Rock Type: volcanic, pumice 2. Size: 16x11x10cm 3. Shape / Angularity: rounded 4. Color of cut surface: light grey, slightly brownish 5. Texture / Vesicularity: highly porous 50% unfilled, vesicles elongated in the same direction 6. Phenocrysts: Cpx 0.5-1mm, 3% 7. Matrix: glassy matrix 9. Encrustations: thin Mn coating on most outer surface							GNS	

SO255-DR68

Description of Location and Structure: Havre Trough,northern profile, eastern part. Ridge like structure along NW flank.

Dredge on bottom UTC 20/03/17 02:24hrs, lat 28 16.60'S, long 178 22,33'W, depth 1500m
Dredge off bottom UTC 20/03/17 03:36hrs, lat 28 16.97'S, long 178 22,17'W, depth 1158m
total volume: 1/4 full mouth dredge blocked by very large pillow
Comments: pillow lava, Ol-Px phyric, with glassy margins

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR68-1	1. Rock Type: volcanic, basalt, pillow fresh 2. Size: 24x19x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, strongly vesicular 25% <1cm partly filled with sediment 6. Phenocrysts: Px 10% <3mm 7. Matrix: fine grained 9. Encrustations: glassy rim ~1cm, palagonite 10. Comment: sample representative for whole dredge	x_air freight box	x		GL		GC in air-freight box	GNS	
SO255-DR68-2	1. Rock Type: volcanic, basalt, pillow fresh 2. Size: 26x19x13cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, vesicularity 20% 1-5mm vesicles 6. Phenocrysts: Ol 5% <1mm; Px 10% <4mm 7. Matrix: fine grained 9. Encrustations: glassy rim ~1cm, palagonite 10. Comment: similar to -1	x	x		GL			GNS	
SO255-DR68-3	1. Rock Type: volcanic, basalt, pillow fresh 2. Size: 27x14x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, vesicularity 20% 1-5mm 6. Phenocrysts: Ol 5% <1mm; Px 10% <2mm 7. Matrix: fine grained 9. Encrustations: glassy rim 1mm 10. Comment: similar to -2 and -3	x_air freight box	x		GL			GNS	
SO255-DR68-4	1. Rock Type: volcanic, basalt, pillow fresh 2. Size: 32x21x15cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, vesicularity 25% 1-2mm ø 6. Phenocrysts: Ol 10% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: similar to prev samples							GNS	
SO255-DR68-5	1. Rock Type: volcanic, basalt, pillow fresh 2. Size: 18x9x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, vesicularity 25% ~4mm 6. Phenocrysts: Ol 5% <1mm; Px 5% <1mm 7. Matrix: fine grained 9. Encrustations: glassy rim ~1cm 10. Comment: similar to prev. samples				GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR68-6	1. Rock Type: volcanic, basalt, pillow fresh 2. Size: 19x15x8cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyritic, vesicularity 25% 0.1 to 1.5cm ø 6. Phenocrysts: Px 10% <3mm 7. Matrix: fine grained 9. Encrustations: glassy rim ~1cm 10. Comment: similar to prev. samples				GL				

SO255-DR69

Description of Location and Structure: Havre Trough, northernmost profile of work area, section. E-W elongated ridge, N facing slope from bottom to top

Dredge on bottom UTC 20/03/17 06:18hrs, lat 28 10.84'S, long 178 28,41'W, depth 1856m
Dredge off bottom UTC 20/03/17 07:51hrs, lat 28 11.29'S, long 178 28,31'W, depth 1435m
total volume: 1/4 full
Comments: pumice, few rocks, relatively fresh pillow basalt, near aphyric with minor Ol-Fsp

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR69-1	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 18x11x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: slightly porphyritic, vesicularity 20% <1cm 6. Phenocrysts: Ol ~1% <1mm ø; some Fsp <1% <1mm ø 7. Matrix: fine grained; glass rind 1cm 8. Secondary Minerals: some softish sediment / foram. ooze 9. Encrustations: glassy rim ~1cm, palagonite 10. Comment: relatively fresh lava; Ol bearing ---> MI's?; glass for spot analysis	x_air freight box	x		GL		GC in air-freight box	GNS	
SO255-DR69-2	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 18x10x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: phenocryst bearing, vesicularity 25% <3mm 6. Phenocrysts: Ol ~1% <1mm ø; Fsp <1% <1mm ø 7. Matrix: fine grained; minor glass rind 9. Encrustations: thin veneer of Mn-oxide 10. Comment: lava appears similar to -1 but with more Fsp and smaller vesicles	x	x		GL			GNS	
SO255-DR69-3	1. Rock Type: volcanic, basaltic lava, fresh 2. Size: 13x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: slightly porphyritic, vesicularity 15 20% <4mm, mostly 2mm 6. Phenocrysts: Fsp 1% <2mm ø; Ol <1% <1mm ø; Px ~1% <1.5mm ø 7. Matrix: fine grained 8. Secondary Minerals: some brown palagonized glass in vesicle 9. Encrustations: mm thin Mn oxide 10. Comment: similar to -1 and -2 but Px bearing	x_air freight box	x		GL			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR69-4	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 11x7x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey, some more pale grey along chilled margin 5. Texture / Vesicularity: vesicularity 25-30%, 5mm ø 6. Phenocrysts: Ol ~1% <1mm ø; Fsp <1% <1mm ø; Px ~2% <1.5mm 7. Matrix: fine grained; ~4-5mm glass rind, not cut off because too tiny 10. Comment: similar to -3; Px bearing	x							
SO255-DR69-5	1. Rock Type: volcanic, basaltic lava 2. Size: 8x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: vesicularity 30% <3mm 6. Phenocrysts: Ol ~5% <3mm ø; some Fsp ~1mm ø 7. Matrix: fine grained 9. Encrustations: <mm Mn crust 10. Comment: 7mm chilled margin across top, 1.3cm coarse grained sand on bottom	x_air freight box						GNS	
SO255-DR69-6	1. Rock Type: volcanic, basaltic lava 2. Size: 9x7x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly porphyritic, vesicularity 30% most 1mm up to 5mm 6. Phenocrysts: Ol ~5% up to 1mm ø; Plg <1% 7. Matrix: fine grained 9. Encrustations: 13mm coarse sand up to 4mm attached								
SO255-DR69-7	1. Rock Type: volcaniclastic 2. Size: 15x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light brown, black 5. Texture / Vesicularity: monomectic 6. Phenocrysts: basalt clasts up to 4cm with Ol up to 1mm 7. Matrix: medium grained mud brown with small volcanic fragments 8. Secondary Minerals: some softish sediment / foram ooze 9. Encrustations: coarse volcanic fallout 1cm 10. Comment: largest clast 3x2.8cm								
SO255-DR69-8	1. Rock Type: pumice, felsic, silicic 2. Size: 14x12x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: whitish grey 5. Texture / Vesicularity: porphyritic, vesicularity 15% up to 1.3cm 6. Phenocrysts: mafic fragments up to 3mm 3% 7. Matrix: fine grained							GNS	
SO255-DR69-9	1. Rock Type: pumice, felsic, silicic 2. Size: 13x10x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: white grey 5. Texture / Vesicularity: porphyritic, vesicularity 10% up to 1.4cm 6. Phenocrysts: 1% mafic fragments up to 3mm 7. Matrix: fine grained							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR69-10	1. Rock Type: sediment 2. Size: 15x12x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light brown 7. Matrix: medium grained 8. Secondary Minerals: 9. Encrustations: <1mm Mn crust 10. Comment: bioturbated, darker brown spots <1% mafic specs								
SO255-DR69-11	1. Rock Type: sediment 2. Size: 14x13x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light brown, dark brown, black 7. Matrix: medium grained 9. Encrustations: <1mm Mn crust 10. Comment: bioturbated brown rings, <1% mafic specs								

SO255-DR70

Description of Location and Structure: Central Havre Trough, NW-SE elongated cone, steep NW slope

Dredge on bottom UTC 20/03/17 10:07hrs, lat 28 14.00'S, long 178 32,62'W, depth 1758m

Dredge off bottom UTC 20/03/17 11:14hrs, lat 28 14.44'S, long 178 32,42'W, depth 1441m

total volume: 1/3 full

Comments: pumice only

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR70-1	1. Rock Type: silicic pumice 2. Size: 15x18x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey white 5. Texture / Vesicularity: vesicularity 15% up to 5mm 6. Phenocrysts: Amph 1% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust							GNS	
SO255-DR70-2	1. Rock Type: silicic pumice 2. Size: 9x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey white 5. Texture / Vesicularity: vesicularity 20% up to 1cm 6. Phenocrysts: Amph 1% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust							GNS	
SO255-DR70-3	1. Rock Type: silicic pumice 2. Size: 13x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey white 5. Texture / Vesicularity: vesicularity 20% up to 5mm 6. Phenocrysts: Amph 1% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: black streaks							GNS	

Appendix 2 (Station Details and Rock Description)

SO255-DR71

Description of Location and Structure: Central Havre Trough, western edge of cone field along W-slope of a cone-ridge structure

Dredge on bottom UTC 20/03/17 13:48hrs, lat 28 13.82'S, long 178 41,41'W, depth 2458m

Dredge off bottom UTC 20/03/17 15:04hrs, lat 28 14.13'S, long 178 41,06'W, depth 2072m

total volume: one rock

Comments: pumice

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR71-1	1. Rock Type: silicic pumice 2. Size: 8x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: white grey 5. Texture / Vesicularity: vesicularity 5% up to 3mm 6. Phenocrysts: Amph 1% up to 3mm 7. Matrix: fine grained 10. Comment: nice Amph							GNS	

SO255-DR72

Description of Location and Structure: Central Havre Trough, northern profile; western edge of seamount field

Dredge on bottom UTC 20/03/17 17:05hrs, lat 28 13.50'S, long 178 36,21'W, depth 1673m

Dredge off bottom UTC 20/03/17 18:10hrs, lat 28 13.87'S, long 178 36,08'W, depth 1305m

total volume: empty

SO255-NET73

Description of Location and Structure: Central Havre Trough, northern profile; western edge of seamount field

Start UTC 20/03/17 20:56hrs, lat 28 07.52'S, long 179 01,00'W, depth 2146m

Dredge off bottom UTC 20/03/17 21:31hrs, lat 28 07.99'S, long 179 00,30'W, depth 2086m

SO255-DR74

Description of Location and Structure: Central Havre Trough, East of deepest flat part, circular cone, NW flank of small cone from bottom to top

Dredge on bottom UTC 20/03/17 22:35hrs, lat 28 8.16'S, long 179 0,27'W, depth 2066m

Dredge off bottom UTC 20/03/17 23:55hrs, lat 28 8.51'S, long 178 59,86'W, depth 1794m

total volume:

Comments: pumice

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR74-1	1. Rock Type: volcanic pumice 2. Size: 14x10x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: pale beige 5. Texture / Vesicularity: porous, glassy, strongly vesicular 6. Phenocrysts: black volcanic clasts; Px phenocrysts 7. Matrix: glassy							GNS	
SO255-DR74-2	1. Rock Type: volcanic pumice 2. Size: 12x9x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: pale beige 5. Texture / Vesicularity: porous, glassy, strongly vesicular 6. Phenocrysts: black volcanic clasts; Px phenocrysts 7. Matrix: glassy								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR74-3	1. Rock Type: volcanic pumice 2. Size: 14x10x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: pale beige 5. Texture / Vesicularity: porous, glassy, strongly vesicular 6. Phenocrysts: black volcanic clasts; Px phenocrysts 7. Matrix: glassy 9. Encrustations: thin Mn coating								

SO255-DR75

Description of Location and Structure: Coleville Ridge, western end of northermost profile, conical seamount, NW facing flank from bottom to top

Dredge on bottom UTC 21/03/17 04:33hrs, lat 28 5.43'S, long 179 28,08'W, depth 995m

Dredge off bottom UTC 21/03/17 06:46hrs, lat 28 5.83'S, long 179 27,94'W, depth 676m

total volume: 1/3 full

Comments: volcaniclastics and pumice

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR75-1	1. Rock Type: volcaniclastic, highly oxidized, altered 2. Size: 55x45x14cm original size of block P 3. Shape / Angularity: subangular 4. Color of cut surface: red brown white 5. Texture / Vesicularity: 2% vesicles, monomictic 6. Phenocrysts: red oxidized clasts up to 4x2.6cm with mafic minerals 7. Matrix: fine grained white silica or CC 8. Secondary Minerals: 4mm Mn crust 9. Encrustations: matrix silica from orginal rock							GNS	
SO255-DR75-2	1. Rock Type: volcaniclastic, highly oxidized, altered 2. Size: 32x42x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: clasts red brown to black; matrix white yellow 5. Texture / Vesicularity: <1% vesicles, polymictic 6. Phenocrysts: oxidized clasts up to 1.5x1.5cm 7. Matrix: fine grained white silica or CC 8. Secondary Minerals: 0.5cm Mn crust 9. Encrustations: matrix silica from orginal rock								
SO255-DR75-3	1. Rock Type: volcaniclastic, highly oxidized, altered 2. Size: 20x20x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: red-brown, yellow; chilled margin within clast 5. Texture / Vesicularity: 1% vesicles, monomictic 6. Phenocrysts: oxidized clasts up to 3.5x3cm 7. Matrix: fine grained mud? 8. Secondary Minerals: 0.1mm Mn crust 10. Comment: different matrix than -1 and -2							GNS	
SO255-DR75-4	1. Rock Type: volcaniclastic, highly oxidized, altered 2. Size: 11x20x5cm subangular 3. Shape / Angularity: subangular 4. Color of cut surface: clasts red brown; matrix light yellow 5. Texture / Vesicularity: 1% vesicles, monomictic 6. Phenocrysts: oxidized clasts up to 1.5x1.6cm with mafic minerals 7. Matrix: fine grained mud? 8. Secondary Minerals: 0.1mm Mn crust 10. Comment: more clasts and smaller ones than in -3								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR75-5	1. Rock Type: silicic pumice 2. Size: 20x16x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow, grey, pink 5. Texture / Vesicularity: porphyric 20% vesicles 6. Phenocrysts: Amph 2% 7. Matrix: fine grained 10. Comment: highly altered							GNS	

SO255-DR76

Description of Location and Structure: Colville Ridge, northwesternmost part of the survey area; NW mid-flank of large, flat topped seamount

Dredge on bottom UTC 21/03/17 12:54hrs, lat 28 1.41'S, long 179 45,97'W, depth 1018m

Dredge off bottom UTC 21/03/17 14:47hrs, lat 28 1.54'S, long 179 45,95'W, depth 877m

total volume: 1/3 full

Comments: One large boulder of solid lava and several smaller rounded pieces of dense lava ---> probably sheet flow. -1 is a highly Fsp phyric lava with some Px while -2 appears to be a Ol-Px-Plg lava. -3 through -8 are more strongly altered lava with variable Px-Fsp content that require TS inspection for detailed mineral content and degree of alteration.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR76-1	1. Rock Type: volcanic, altered 2. Size: 27x18x23cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Px ~7% <4mm; Fsp 20-25% <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn 10. Comment: minerals are altered, alteration halo	x_air freight box	x					GNS	
SO255-DR76-2	1. Rock Type: volcanic, highly altered 2. Size: 21x16x10cm 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Ol 15% 2-3mm 2-3% altered to iddingsite ; Px ~15% 4-5mm <4mm; Plg 10% ~2mm, Mt?, Amph? 7. Matrix: fine grained 9. Encrustations: rim of sediment conglomerate, Mn crust 5mm	x_air freight box	x					GNS	
SO255-DR76-3	1. Rock Type: volcanic, strongly altered basalt 2. Size: 58x40x33cm original size of block P, 28x16x11cm working half 3. Shape / Angularity: angular 4. Color of cut surface: greenish, blackish, beige 5. Texture / Vesicularity: porphyric, vesicles ~7% <2mm 6. Phenocrysts: Px ~5% <6mm; Fsp 15% <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn 10. Comment: strong alteration of matrix and minerals	x_air freight box	x					GNS	
SO255-DR76-4	1. Rock Type: volcaniclastic, slightly altered basalt 2. Size: 30x12x13cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Iddingsite ~5% <8mm; Fsp ~10% <3mm; Px ~10% <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: mainly altered minerals, fairly fresh matrix	x_air freight box	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR76-5	1. Rock Type: volcaniclastic, altered 2. Size: 27x11.5x9.5cm 3. Shape / Angularity: subangular 4. Color of cut surface: green / grey 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px ~5% 7. Matrix: fine grained 8. Secondary Minerals: MT? 9. Encrustations: 5.5cm volcaniclastic breccia, largest clast 3.5x1.5cm, multicolored, polymict dark brown matrix, 1mm Mn crust 10. Comment: minerals are altered, alteration halo	x_air freight box	x					GNS	
SO255-DR76-6	1. Rock Type: volcaniclastic, altered 2. Size: 39x36x18cm stated in sheet = orginal size of block J? size sheet states 14x13x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: red brown 5. Texture / Vesicularity: porphyric, 7% vesicles 6. Phenocrysts: Px ~5% <6mm; Ol 2% <4mm Fsp 1% 7. Matrix: fine grained 8. Secondary Minerals: Iddingsite 7% <3mm, crystal rich vesicles	x_air freight box	x					GNS	
SO255-DR76-7	1. Rock Type: volcanic, altered 2. Size: 11x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light green - grey 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px ~5% <3mm; Amph 1%; Ol 1% 7. Matrix: fine grained 8. Secondary Minerals: MT 9. Encrustations: <1mm Mn, 14mm multicolored sediment / conglomerate with up to 4mm clasts								
SO255-DR76-8	1. Rock Type: volcanic, altered 2. Size: 32x12x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: light brown 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px ~5% <3mm; Ol 3% <5mm 7. Matrix: fine grained 8. Secondary Minerals: MT? 9. Encrustations: <1mm Mn crust								
SO255-DR76-9	1. Rock Type: volcanic, strongly altered, volcaniclastic? 2. Size: 16x11x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish red 5. Texture / Vesicularity: porphyric, vesicles 1-2mm filled with secondary minerals 6. Phenocrysts: Px ~20% <1mm; Fsp 25%; Ol ~10% <2mm 7. Matrix: fine grained, strongly altered 8. Secondary Minerals: greenish whitish secondary minerals 9. Encrustations: <1mm Mn crust 10. Comment: strongly altered , few clasts								
SO255-DR76-10	1. Rock Type: conglomerate, strongly altered 2. Size: 20x6x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: blackish, beige, brownish 5. Texture / Vesicularity: clasts <8mm 7. Matrix: strongly altered silicate matrix (?) 8. Secondary Minerals: clasts with strongly altered Fsp 9. Encrustations: <1mm Mn crust 10. Comment: most altered sample of dredge								

SO255-CTD77

Description of Location and Structure: Colville Ridge, northewrn Havre Trough Profile

Start UTC 21/03/17 19:42hrs, lat 28 30.13'S, long 179 35,73'W, depth 1435m
On Deck UTC 21/03/17 20:05hrs, lat 28 30.13'S, long 179 35,76'W, depth 1416m
CTD lowerd to 200 m

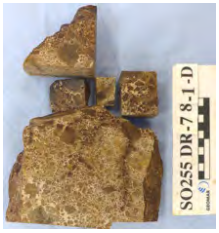
SO255-DR78

Description of Location and Structure: Colville Ridge, northern Havre Trough profile; E-W striking ridge, part of a large SW-NE striking feature beounded by SE falult that could not be dredged due to wind and sea conditions- Track along N-dipping slope in mid-section

Dredge on bottom UTC 21/03/17 21:14hrs, lat 28 30.13'S, long 179 35,78'W, depth 1372m
Dredge off bottom UTC 21/03/17 22:32hrs, lat 28 30.57'S, long 179 35,89'W, depth 1002m
total volume: few rocks
Comments: large volcanic breccia block (C), several igneous clasts recovered and labelled -1A, -1B etc

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR78-1A	1. Rock Type: volcanic, heavily altered 2. Size: 4x3x3cm individual clast from block C (54x27x26cm) 3. Shape / Angularity: angular 4. Color of cut surface: grey, altered parts are brown 5. Texture / Vesicularity: porphyric, vesicularity 15-20% partly filled 6. Phenocrysts: Fsp 15% small sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: larger vesicles filled with fine grained sediment, possibly Mn in some 9. Encrustations: <5mm Mn crust 10. Comment: clast taken from a large boulder of volcaniclastic sediment	x_air freight box	x						
SO255-DR78-1B	1. Rock Type: volcanic, heavily altered 2. Size: 4x3x3cm individual clast from block C (54x27x26cm) 3. Shape / Angularity: angular 4. Color of cut surface: grey, altered parts are brown 5. Texture / Vesicularity: porphyric, vesicularity 15-20% partly filled 6. Phenocrysts: Fsp 15% small sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: larger vesicles filled with fine grained sediment, possibly Mn in some 9. Encrustations: <5mm Mn crust 10. Comment: clast taken from a large boulder of volcaniclastic sediment	x_air freight box	x						
SO255-DR78-1C	1. Rock Type: volcanic, heavily altered 2. Size: 4x3x3cm individual clast from block C (54x27x26cm) 3. Shape / Angularity: angular 4. Color of cut surface: grey, altered parts are brown 5. Texture / Vesicularity: porphyric, vesicularity 15-20% partly filled 6. Phenocrysts: Fsp 15% small sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: larger vesicles filled with fine grained sediment, possibly Mn in some 9. Encrustations: <5mm Mn crust 10. Comment: clast taken from a large boulder of volcaniclastic sediment	x	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR78-1D	1. Rock Type: volcanic, heavily altered 2. Size: 4x3x3cm individual clast from block C (54x27x26cm) 3. Shape / Angularity: angular 4. Color of cut surface: grey, altered parts are brown 5. Texture / Vesicularity: porphyric, vesicularity 15-20% partly filled 6. Phenocrysts: Fsp 15% small sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: larger vesicles filled with fine grained sediment, possibly Mn in some 9. Encrustations: <5mm Mn crust 10. Comment: clast taken from a large boulder of volcaniclastic sediment	x	x						
SO255-DR78-1E	1. Rock Type: volcanic, heavily altered 2. Size: 4x3x3cm individual clast from block C (54x27x26cm) 3. Shape / Angularity: angular 4. Color of cut surface: grey, altered parts are brown 5. Texture / Vesicularity: porphyric, vesicularity 15-20% partly filled 6. Phenocrysts: Fsp 15% small sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: larger vesicles filled with fine grained sediment, possibly Mn in some 9. Encrustations: <5mm Mn crust 10. Comment: clast taken from a large boulder of volcaniclastic sediment	x	x						
SO255-DR78-2	1. Rock Type: volcanic, heavily altered 2. Size: 4x3x3cm individual clast from block C (54x27x26cm) 3. Shape / Angularity: angular 4. Color of cut surface: grey, altered parts are brown 5. Texture / Vesicularity: porphyric, vesicularity 15-20% partly filled 6. Phenocrysts: Fsp 15% small sub-mm needles 7. Matrix: fine grained 8. Secondary Minerals: larger vesicles filled with fine grained sediment, possibly Mn in some 9. Encrustations: <5mm Mn crust 10. Comment: clast taken from a large boulder of volcaniclastic sediment	x	x						

SO255-DR79

Description of Location and Structure: Colville Ridge, small cone like structure at the base along the eastern flank of Colville Ridge; just beneath DR78

Comment: Cancelled due to technical issues with winch, followed by 36hrs mapping noted as station 81 in station book

SO255-NET80

Start towing UTC 22/03/17 15:36hrs, lat 29 5.97'S, long 179 43,28'W, depth 1252m
On Deck UTC 21/03/17 16:06hrs, lat 29 6.46'S, long 179 43,01'W, depth 1266m
Net lowerd to 100 m then towed at 1.5kn

SO255-DR82

Description of Location and Structure: Colville Ridge, cone on central part of the ridge

Dredge on bottom UTC 23/03/17 12:30hrs, lat 30 46.98'S, long 179 38,30'W, depth 817m
Dredge off bottom UTC 21/03/17 13:35hrs, lat 30 47.33'S, long 179 38,21'W, depth 585m
total volume: 1/5 full
Comments: Five blocks of volcaniclastics with biogenic components

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR82-1	1. Rock Type: sediment, volcaniclastic 2. Size: 40x30x24cm original size of block C, 23x21x14cm sample 3. Shape / Angularity: subrounded 4. Color of cut surface: yellowish brown 5. Texture / Vesicularity: <2mm grains / clasts 7. Matrix: medium grained 8. Secondary Minerals: biogenetic crust (shells?) 9. Encrustations: <1mm Mn crust 10. Comment: contain biogenetic fragments							GNS	
SO255-DR82-2	1. Rock Type: sediment, volcaniclastic 2. Size: 26x36x13cm original size of block P, 22x20x11cm sample 3. Shape / Angularity: subrounded 4. Color of cut surface: dark brown 5. Texture / Vesicularity: <3mm grains / clasts 7. Matrix: medium grained 8. Secondary Minerals: biogenetic fragments (shells?) 9. Encrustations: <1mm Mn crust 10. Comment: contains biogenetic fragments; similar to -1								
SO255-DR82-3	1. Rock Type: sediment, volcaniclastic 2. Size: 28x13x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark brown 5. Texture / Vesicularity: <4mm grains / clasts 7. Matrix: medium grained 8. Secondary Minerals: biogenetic crust (shells?) 9. Encrustations: <1mm Mn crust 10. Comment: contains biogenetic fragments, similar to -1 and -2								

SO255-DR83

Description of Location and Structure: Seamount cluster W of Coleville Ridge; E-W elongated, oval shaped seamount with cone like top; NE facing slope beneath small cone in the lower section

Dredge on bottom UTC 23/03/17 17:24hrs, lat 30 34.21'S, long 179 14,85'W, depth 2150m
Dredge off bottom UTC 21/03/17 18:21hrs, lat 30 34.48'S, long 179 14,96'W, depth 1849m
total volume: one rock
Comments: Mn crust with sediment or heavily altered volcanic components

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR83-1Mn	1. Rock Type: Mn crust with sediment or heavily altered volcanic rock 2. Size: 13x9x7cm 3. Shape / Angularity: subrounded to subangular 4. Color of cut surface: Mn crust black, rock is brownish 5. Texture / Vesicularity: porphyric no vesicles 6. Phenocrysts: Cpx 15-20% 0.5-2mm, elongated shape maybe Amph, Fsp 5% 0.5-1mm 7. Matrix: fine grained 9. Encrustations: 3cm Mn crust 10. Comment: check TS to distinguish rock type (sediment or volcanic)	x						GNS	

SO255-DR84

Description of Location and Structure: Seamount cluster W of Coleville Ridge; circular seamount, cone shaped = no flat top, SE flank from upper 2/3 to top

Dredge on bottom UTC 23/03/17 22:00hrs, lat 30 28.66'S, long 179 24,51'W, depth 1891m
Dredge off bottom UTC 21/03/17 23:19hrs, lat 30 28.28'S, long 179 24,38'W, depth 1547m
total volume: few rocks
Comments: Mn encrusted sediment / volcaniclastics

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR84-1Mn	1. Rock Type: Mn crust with large block of sediment 2. Size: 20x14x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: Mn crust black, sediment brown 5. Texture / Vesicularity: medium sand, clasts within fine grained matrix 6. Phenocrysts: Cpx 15-20% 0.5-2mm, elongated shape maybe Amph, Fsp 5% 0.5-1mm 7. Matrix: fine grained 8. Secondary Minerals: dentritic Mn from Mn crust into sediment 9. Encrustations: 0.5 - 2.5cm Mn crust 10. Comment: sample representative for dredge								

SO255-DR85

Description of Location and Structure: Western margin of Coleville Ridge; large seamount like structure that is connected to C.R. along its NE end. Track along SE flank lower section above NE-SW strinking fault? Valley

Dredge on bottom UTC 24/03/17 02:51hrs, lat 30 28.88'S, long 179 45,57'W, depth 1200m
Dredge off bottom UTC 24/03/17 04:31hrs, lat 30 12.41'S, long 179 45,57'W, depth 755m
total volume: few rock
Comments: At least two volcanic rocks recovered; -1 is a moderately altered highly Plg phyric andesite with some Px while -2 appears more altered and less Plg-Px phyric. -3 and -4 are volcaniclastics

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR85-1	1. Rock Type: volcanic, moderately altered andesite-dacite 2. Size: 30x33x22cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown - grey 5. Texture / Vesicularity: porphyritic, non-vesicular, dense 6. Phenocrysts: felsic Fsp 20% <4mm fresh; Qtz?! 5% <2mm, mafic MT 10% <5mm; Px? 7. Matrix: fine grained 8. Secondary Minerals: partly weatherd Fsp 9. Encrustations: thin Mn coating 10. Comment: realatively fresh sample dense no fractures, two different Fsp?, magnetic	x_air freight box	x	1-2				GNS	
SO255-DR85-2	1. Rock Type: volcanic, moderately altered 2. Size: 15x11x9cm 3. Shape / Angularity: rounded 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyritic, moderate vesicular 5% <2mm 6. Phenocrysts: felsic Fsp 5% <2mm fresh; mafic Px needle like 7% <2mm weathered 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: volcanic clasts in matrix; compressed pumice clasts?	x_air freight box	x	2-3				GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR85-3	1. Rock Type: volcaniclastic, strongly weathered / altered 2. Size: 15x11x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark brown - dark grey 5. Texture / Vesicularity: brecciated rounded volcanic clasts, highly vesicular 20% <2mm, few larger vesicles 6. Phenocrysts: volcanic clasts; pumice scoria; one large black clast (ø 6.5cm) with felsic phenocrysts 10% <1mm 7. Matrix: brecciated 8. Secondary Minerals: Mn veins through matrix 9. Encrustations: thin Mn coating	x							
SO255-DR85-4	1. Rock Type: volcaniclastic?, lava flow 2. Size: 14x9x5cm 3. Shape / Angularity: angular 4. Color of cut surface: brownish - green yellow 5. Texture / Vesicularity: porphyritic, flow texture, weakly vesicular <1% <1mm 6. Phenocrysts: felsic: Fsp 5% <3mm; mafic: dark mineral grains 10% <3mm MT? 7. Matrix: fine grained flow texture 8. Secondary Minerals: Mn veins 9. Encrustations: thin Mn coating 10. Comment: magnetic	x		2					

SO255-DR86

Description of Location and Structure: Western margin of Coleville Ridge; large seamount like structure that is connected to C.R. along its NE end. 1nm S of DR85 at the very bottom of the slope; repeat station

Dredge on bottom UTC 24/03/17 05:54hrs, lat 30 13.22'S, long 179 45,70'W, depth 1510m
Dredge off bottom UTC 24/03/17 04:31hrs, lat 30 12.87'S, long 179 45,72'W, depth 1163m
total volume: empty

SO255-DR87

Description of Location and Structure: Coleville Ridge S of Giggenbach profile; NE-SW trending ridge; SE dipping slope from bottom to top

Dredge on bottom UTC 24/03/17 05:54hrs, lat 30 13.22'S, long 179 45,70'W, depth 1510m
Dredge off bottom UTC 24/03/17 13:18hrs, lat 29 54.86'S, long 179 45,01'W, depth 1352m
total volume: one rock
Comments: biogenic sediment

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR87-1	1. Rock Type: sedimentary rock, biogenic 2. Size: 20x14x7cm 3. Shape / Angularity: rounded 4. Color of cut surface: brown - white 5. Texture / Vesicularity: 2cm vesicle 7. Matrix: finer texture may be biogenic 8. Secondary Minerals: biogenic 9. Encrustations: 2mm Mn crust 10. Comment: biogenic								

SO255-DR88

Description of Location and Structure: Coleville Ridge at Western end of Giggenbach profile; large seamount / ridge structure with small flat plateau at 500mbsl. E facing slope at northern termination lowermost section

Dredge on bottom UTC 24/03/17 16:38hrs, lat 29 32.17'S, long 179 44,24'W, depth 1785m
Dredge off bottom UTC 24/03/17 17:26hrs, lat 29 32.01'S, long 179 44,56'W, depth 1533m
total volume: very few rocks
Comments: 2x pumice

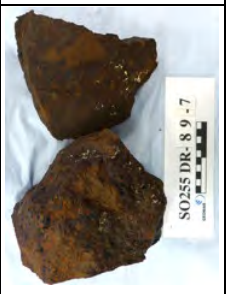
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR88-1	1. Rock Type: pumice silicic altered 2. Size: 8x7x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: white grey 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: Amph 5%; mafic clasts 2% up to 8x5mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust								
SO255-DR88-2	1. Rock Type: pumice silicic altered 2. Size: 10x8x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: white grey 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: Amph 3%; mafic clasts 2% up to 3x5mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust								

SO255-DR89

Description of Location and Structure: Coleville Ridge at Western end of Giggenbach profile; large seamount / ridge structure with steep E facing slope. Repeat of DR88; 3nm SSW upper section of slope

Dredge on bottom UTC 24/03/17 19:29hrs, lat 29 35.18'S, long 179 46,00'W, depth 1013m
Dredge off bottom UTC 24/03/17 21:41hrs, lat 29 35.14'S, long 179 46,16'W, depth 844m
total volume: few rocks
Comments: single andesitic lava clast (-1) with abundant <1mm sized Plg and Px; various volcaniclastic rocks -2 to -7

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR89-1	1. Rock Type: volcanic clast, andesite fresh 2. Size: 13x8x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: 3% <1mm vesicles; porphyric 6. Phenocrysts: Fsp 40% <1mm, white elongated; Px black greenish 20%, 1%>2mm others <1mm 7. Matrix: aphyric, homogeneous 9. Encrustations: thick Mn crust 0.5-3cm, CC coating 0.5cm in a few spots 10. Comment: clast much smaller	x_air freight box	x	3					
SO255-DR89-2	1. Rock Type: volcanic clast, heavily altered 2. Size: 6x5x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown grey 5. Texture / Vesicularity: 10% <1mm vesicles; apyric 7. Matrix: aphyric 8. Secondary Minerals: Mn filling of vesicles, CC in vesicles and veins 9. Encrustations: thin Mn coating	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR89-3	1. Rock Type: volcanic clast, heavily altered, scoria? 2. Size: 7x6x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: 40% 0.1 to 2mm mm aphyric 7. Matrix: aphyric 8. Secondary Minerals: CC and Mn fillings in vesicles and veins 9. Encrustations: thin Mn coating 10. Comment: sample -2 through -7 individual clasts from block D; 70x45x25cm original size	x	x						
SO255-DR89-4	1. Rock Type: volcanic clast, scoria, heavily altered 2. Size: 5x3x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: 40% 0.5 to 2mm mm aphyric 7. Matrix: aphyric, highly vesicular 8. Secondary Minerals: CC and Mn fillings in vesicles 10. Comment: clasts from block D	x	x						
SO255-DR89-5	1. Rock Type: volcanic clast, heavily altered, scoria 2. Size: 6x3x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: aphyric, brecciated, vesicularity 40% <3mm 7. Matrix: fine grained aphyric 8. Secondary Minerals: Mn veins cutting through rock, CC fillings 9. Encrustations: thin Mn coating 10. Comment: clast from block D							backup	
SO255-DR89-6	1. Rock Type: volcanic clast, heavily altered, scoria 2. Size: 7x6x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: aphyric, brecciated, vesicularity 30% <5mm 6. Phenocrysts: volcanic clasts 7. Matrix: fine grained, aphyric 8. Secondary Minerals: Mn veins cutting through rock, CC fillings in vesicles 10. Comment: clast from block D							backup	
SO255-DR89-7	1. Rock Type: volcanic clast, heavily altered 2. Size: 6x4x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: aphyric, brecciated, highly vesicular 6. Phenocrysts: volcanic clasts without phenocrysts 7. Matrix: fine grained 8. Secondary Minerals: Mn veins cutting through rock, CC fillings in veins and fractures 10. Comment: clast from block D							GNS, backup	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR89-8	1. Rock Type: sediment carbonate 2. Size: 16x12x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: pale beige 5. Texture / Vesicularity: strongly vesicular, compact, vesicles 30% <1cm 7. Matrix: fine grained sandy 9. Encrustations: Mn fillings in vesicles 10. Comment: fossils?! recent biology							GNS	

SO255-DR90

Description of Location and Structure: Coleville Ridge Eastern flank, repeat of DR89 at deeper section, 2nm SE. SE-facing slope of small step within Eastern Colville slope

Dredge on bottom UTC 24/03/17 23:28hrs, lat 29 36.86'S, long 179 45,45'W, depth 1487m
Dredge off bottom UTC 25/03/17 00:42hrs, lat 29 36.60'S, long 179 45,66'W, depth 1180m
total volume: few rocks
Comments: three large blocks of sediment with volcanic components

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR90-1	1. Rock Type: sediment, volcanic components, altered 2. Size: 24x23x11cm original size of block T 3. Shape / Angularity: subrounded 4. Color of cut surface: brown 5. Texture / Vesicularity: layered, fine to coarse grained, 3 1mm clasts, moderate vesicular 7. Matrix: fine grained 8. Secondary Minerals: Mn veins, Mn + CC in vesicles?! 9. Encrustations: Mn coating	x						GNS	
SO255-DR90-2	1. Rock Type: sediment, consolidated mud 2. Size: 47x28x10cm original size of block R 3. Shape / Angularity: rounded 4. Color of cut surface: brown 5. Texture / Vesicularity: dense no sedimentary structure no vesicles 7. Matrix: fine grained 8. Secondary Minerals: Mn veins + patches, CC in matrix 9. Encrustations: Mn coating 1mm, Mn crust up to 1mm	x						GNS	

SO255-DR91

Description of Location and Structure: Coleville Ridge northern section, guyot on ridge crest, mid slope to plateau edge on the southern flank

Dredge on bottom UTC 25/03/17 05:44hrs, lat 29 20.09'S, long 179 56,24'E, depth 1111m
Dredge off bottom UTC 25/03/17 07:05hrs, lat 29 19.69'S, long 179 56,40'E, depth 787m
total volume: 1/3 full
Comments: pumice, sediment

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR91-1	1. Rock Type: volcanic pumice 2. Size: 23x16x17cm 3. Shape / Angularity: subrounded 4. Color of cut surface: greyish brown 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: 5% <1mm mafic, Amph? 7. Matrix: fine grained glassy 8. Secondary Minerals: Mn veins, Mn + CC in vesicles?! 9. Encrustations: Mn coating 10. Comment: pumice raft?	x						GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR91-2	1. Rock Type: volcanic pumice 2. Size: 10x10x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark brown ~black 5. Texture / Vesicularity: 25%, cm sized vesicles 6. Phenocrysts: <3% <1mm mafic, Amph? 7. Matrix: fine grained glassy	x						GNS	
SO255-DR91-3	1. Rock Type: volcanic pumice 2. Size: 12x8x8cm 3. Shape / Angularity: angular 4. Color of cut surface: white, whitish grey 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 15% 2mm felsic; 5% mafic 5mm 7. Matrix: fine grained glassy	x							
SO255-DR91-4	1. Rock Type: volcanic pumice 2. Size: 13x14x13cm 3. Shape / Angularity: rounded 4. Color of cut surface: whitish grey 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 10% 1-5mm felsic, 5% 2mm mafic 7. Matrix: fine grained glassy 10. Comment: similar to -3	x							
SO255-DR91-5	1. Rock Type: volcanic pumice 2. Size: 17x10x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: whitish grey 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: 10% 2mm felsic, <3% 1mm mafic 7. Matrix: fine grained glassy	x						GNS	
SO255-DR91-6	1. Rock Type: volcanic pumice 2. Size: 24x18x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: yellow brown 5. Texture / Vesicularity: 10% vesicles up to 3mm 6. Phenocrysts: 10% 1-4mm felsic 7. Matrix: fine grained glassy								
SO255-DR91-7	1. Rock Type: volcanic pumice 2. Size: 21x12x10cm 3. Shape / Angularity: rounded 4. Color of cut surface: yellowish brown 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 5% 2mm felsic, <2% 1mm mafic 7. Matrix: fine grained glassy								
SO255-DR91-8	1. Rock Type: volcanic pumice 2. Size: 12x7x7cm 3. Shape / Angularity: angular 4. Color of cut surface: whitish grey 5. Texture / Vesicularity: 20% vesicles 6. Phenocrysts: 10% 2mm mafic, 15% 2mm mafic 7. Matrix: fine grained glassy 10. Comment: similar to -3, -4 and -5								

SO255-DR92

Description of Location and Structure: Coleville Ridge northern section, guyot on ridge crest, repeat of DR91.

Dredge on bottom UTC 25/03/17 08:42hrs, lat 29 17.89'S, long 179 52,87'E, depth 1120m

Dredge off bottom UTC 25/03/17 09:49hrs, lat 29 17.91'S, long 179 53,24'E, depth 950m

total volume: no rocks, biology

Comments: Initially the biology was thought to be plastic or fibre optics but no sea cable in the area. The material is silicous and fibrous, is up to several mm ø and several dcm up to 1.5 m long. It resembles spines. It was found out that they belong to glassy sponges that are described in the literature to be 10.000 years old and to produce higher quality glass fibre than mankind. Material was sampled by Debbie and GEOMAR.

SO255-DR93

Description of Location and Structure: Western edge of Coleville Ridge northern section. W-facing slope

Dredge on bottom UTC 25/03/17 13:58hrs, lat 28 56.86'S, long 179 54,55'W, depth 1369m
Dredge off bottom UTC 25/03/17 15:00hrs, lat 28 56.68'S, long 179 54,32'W, depth 1004m
total volume: 1/5 full
Comments: one large block and several pieces of dense lava. Lava appears evolved ---> good for dating?

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR93-1	1. Rock Type: volcanic, altered, dacitic lava 2. Size: 75x29x16cm original size of block H, working half 16x9x6cm 3. Shape / Angularity: angular 4. Color of cut surface: greyish green 5. Texture / Vesicularity: 30% vesicles, fractures 1cm long 6. Phenocrysts: 20% <3mm Fsp, 10% <2mm Amph & Px 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x_air freight box	x					GNS	
SO255-DR93-2	1. Rock Type: volcanic, altered, dacitic lava 2. Size: 13x7x7cm 3. Shape / Angularity: angular 4. Color of cut surface: greyish green 5. Texture / Vesicularity: 5% vesicles, fractures 1cm long 6. Phenocrysts: 20% 1-5mm Fsp, 15% 1-3mm Amph & Px 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: similar to -1 but larger Fsp	x_air freight box	x					GNS	
SO255-DR93-3	1. Rock Type: volcanic, altered, dacitic rock 2. Size: 14x8x6cm 3. Shape / Angularity: angular 4. Color of cut surface: greyish green 5. Texture / Vesicularity: cm long fractures 6. Phenocrysts: 20% ~3mm Fsp, 10% ~2mm Amph & Px 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: similar to -2	x_air freight box	x						
SO255-DR93-4	1. Rock Type: volcanic, altered, dacitic rock 2. Size: 19x14x10cm 3. Shape / Angularity: angular 4. Color of cut surface: greyish green 5. Texture / Vesicularity: fractures 1cm long 6. Phenocrysts: 20% <3mm Fsp, 10% <2mm Amph & Px 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: simlar to -2 and -3							GNS	
SO255-DR93-5	1. Rock Type: sedimentary, tuff breccia 2. Size: 19x13x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: white 5. Texture / Vesicularity: fractures 5cm long, vesicles 5mm 7. Matrix: ash <1mm 9. Encrustations: 1mm Mn crust 10. Comment: possibly biogenic							GNS	
SO255-DR93-6	1. Rock Type: sedimentary, tuff breccia 2. Size: 22x14x5cm 3. Shape / Angularity: rounded 4. Color of cut surface: white 5. Texture / Vesicularity: fractures 5mm, vesicles 5mm 7. Matrix: ash <1mm 9. Encrustations: 1mm Mn crust 10. Comment: similar to 5								

SO255-DR94

Description of Location and Structure: Coleville Ridge; circular, cone shaped seamount at W margin of NNE-SSW striking plateau sliver. Seamount appeaers to be located on fault separating the sliver from the main Coleville R. SW flank from bottom to top.

Dredge on bottom UTC 25/03/17 17:31hrs, lat 28 57.82'S, long 179 38,79'W, depth 1103m

Dredge off bottom UTC 25/03/17 18:43hrs, lat 28 57.53'S, long 179 38,57'W, depth 783m

total volume: few

Comments: carbonate sediment

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR94-1	1. Rock Type: sediment, carbonate, weakly altered 2. Size: 16x11x18m 3. Shape / Angularity: subangular 4. Color of cut surface: pale light beige 5. Texture / Vesicularity: dense, compressed carbonate mud, weakly vesicular, large holes 6. Phenocrysts: fossil shells in matrix 7. Matrix: fine grained 9. Encrustations: thin Mn coating							GNS	
SO255-DR94-2	1. Rock Type: sediment, carbonate, altered 2. Size: 25x23x6m 3. Shape / Angularity: subangular 4. Color of cut surface: pale beige to grey 5. Texture / Vesicularity: dense, compressed carbonate mud, weakly vesicular, large holes 6. Phenocrysts: fossil shells in matrix 7. Matrix: fine grained 8. Secondary Minerals: Mn within matrix 9. Encrustations: thin Mn coating							GNS	

SO255-DR95

Description of Location and Structure: Coleville Ridge; E facing flank of NNE-SSW string Coleville R. sliver. Track within half-moon shaped slope failure?. SE dipping slope from mid section to top

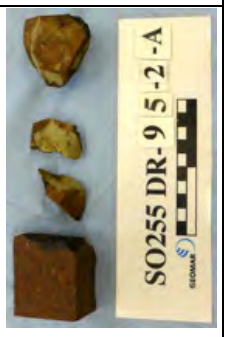
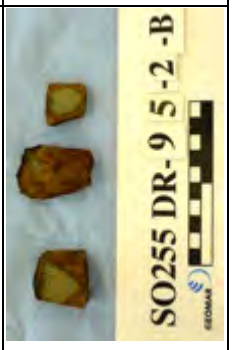
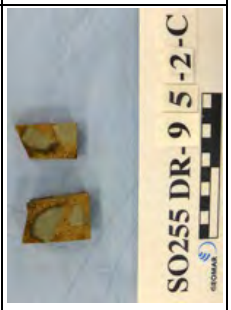
Dredge on bottom UTC 25/03/17 20:17hrs, lat 28 57.21'S, long 179 33,30'W, depth 1402m

Dredge off bottom UTC 25/03/17 21:39hrs, lat 28 56.91'S, long 179 33,47'W, depth 968m

total volume: one large block and several small rock pieces

Comments: volcaniclastic material, epiclastic. Large block H (90x60x32 cm) smashed and multiple cuts on fragments to search for volc. clasts. Samples -1 through 5 all come from block H and -2 had multiple clasts labelled A through D

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR95-1	1. Rock Type: volcaniclastic, epigenetic flow, altered matrix with few several cm sized clasts that are sampled in -1 through -5. 2. Size: 11x6x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyritic, brecciated, weakly vesicular, clast supported 6. Phenocrysts: volcanic clasts up to 5cm , no phenocrysts in clasts 7. Matrix: fine grained, varying clast sizes 8. Secondary Minerals: altered grains, carbonate?! 9. Encrustations: thin Mn coating 10. Comment: cut out of 1 larger clast ø5cm; volcanic sedimentary clasts, part of block H	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR95-2A	1. Rock Type: volcanic clast, relatively fresh from volcaniclastic matrix of sample -2 2. Size: 20x15x12m original size of fragment smashed off block H, clast ø3cm 3. Shape / Angularity: clast subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, weakly vesicular 1% <1mm 6. Phenocrysts: tiny mafic phenocrysts 1mm MT?; Fsp 10% <0.2mm 7. Matrix: very fine grained 8. Secondary Minerals: Mn fillings within clast 9. Encrustations: thin Mn coating 10. Comment: clast from fragment -2 of block H, magnetic	x							
SO255-DR95-2B	1. Rock Type: volcanic clast, relatively fresh from volcaniclastic matrix of sample -2 2. Size: 20x15x12m original size of fragment smashed off block H, clast ø2.5cm 3. Shape / Angularity: clast subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, non-vesicular 6. Phenocrysts: Fsp partly weathered, partly fresh 20% <1mm, mafic minerals in groundmass 5% <0.1mm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: clast from fragment -2 of block H, magnetic	x							
SO255-DR95-2C	1. Rock Type: two (!) volcanic clasts, from volcaniclastic matrix of sample -2, relatively fresh 2. Size: 20x15x12m original size of fragment smashed off block H, clast ø3cm 3. Shape / Angularity: clast 1: ø2cm, clast 2: ø1cm 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyritic, dense 6. Phenocrysts: clast 1; Fsp 15% <0.5mm partly weathered; clast 2; felsic and mafic minerals <0.1mm 7. Matrix: very fine grained 8. Secondary Minerals: Mn fillings within clast 9. Encrustations: thin Mn coating 10. Comment: clast from fragment -2 of block H, magnetic	x							
SO255-DR95-2D	1. Rock Type: volcanic clast from volcaniclastic matrix of sample -2, relatively fresh 2. Size: clast ø1.5cm 3. Shape / Angularity: subangular clast 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, non-vesicular 6. Phenocrysts: only very small mafic grains in matrix visible 5% <0.1mm; Fsp in groundmass 7. Matrix: very fine grained 8. Secondary Minerals: Mn fillings within clast 9. Encrustations: thin Mn coating 10. Comment: magnetic								
SO255-DR95-3	1. Rock Type: volcaniclastic, volc. and sed. clasts 2. Size: 18x11x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyritic, brecciated, weak vesicularity, clast supported 6. Phenocrysts: volcanic pumice and sediment clasts 1mm to 8cm 7. Matrix: fine grained, varying clast sizes 9. Encrustations: thin Mn coating 10. Comment: one large sediment clast 8cm ø, some larger volcanic clasts 1-2 cm, may be drilled or carefully cut out with smaller blade	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR95-4	1. Rock Type: volcaniclastic, volcanic and sedimentary clasts 2. Size: 34x28x10m 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyritic clasts, brecciated, weakly vesicular, clast supported 6. Phenocrysts: some larger volcanic clasts up to 3cm , contain phenocrysts felsic and mafic 7. Matrix: fine grained 10. Comment: some larger fresh clasts, some clasts magnetic, three slices / slabs were cut							GNS	
SO255-DR95-5	1. Rock Type: volcaniclastic, volcanic and sedimentary clasts 2. Size: 28x26x15m 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: brecciated, porphyritic volcanic clasts, weakly vesicular, clast supported 6. Phenocrysts: one clast contains fresh Fsp phenocrysts 10% <2mm 7. Matrix: fine grained 10. Comment: some larger fresh volcanic clasts, magnetic, two slices / slabs were cut							GNS	
SO255-DR95-6	1. Rock Type: sediment, sandstone 2. Size: 13x8x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown 5. Texture / Vesicularity: compact sand, non-vesicular 7. Matrix: medium to fine grained, sand - silt 9. Encrustations: Mn crust 10. Comment: check for zircons	x							
SO255-DR95-7	1. Rock Type: volcaniclastic, sediment 2. Size: 15x14x9cm 3. Shape / Angularity: rounded 4. Color of cut surface: brown 5. Texture / Vesicularity: compressed volcaniclastic sediment, non vesiclar 6. Phenocrysts: some phenocryst free volvanic clasts 7. Matrix: fine grained, clasts up to 1cm, well sorted 9. Encrustations: thin Mn crust 0.2mm	x							
SO255-DR95-8	1. Rock Type: volcaniclastic 2. Size: 16x8x5m 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: compact volcaniclastic, clast supported 6. Phenocrysts: 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: thin Mn crust 10. Comment: no large volcanic clasts visible	x							

SO255-DR96

Description of Location and Structure: Colville Ridge; northern section. Seamount like feature at eastern flank of Colville Ridge, upper SE flank

Dredge on bottom UTC 26/03/17 00:19hrs, lat 28 42.17'S, long 179 38,82'W, depth 1426m

Dredge off bottom UTC 26/03/17 01:44hrs, lat 28 42.04'S, long 179 38,84'W, depth 1305m

total volume: few rocks

Comments: 4 small pieces of pumice; sampled by UTAS?

SO255-DR97

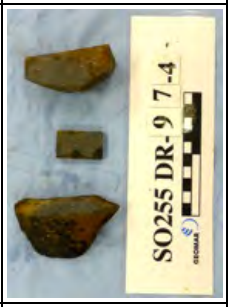
Description of Location and Structure: Colville Ridge; northern section. SE facing side of NNE-SSW scarp cutting this sliver of Colville R. into two halfs. SE facing slope from bottom to top

Dredge on bottom UTC 26/03/17 03:32hrs, lat 28 35.36'S, long 179 41,48'W, depth 1210m

Dredge off bottom UTC 26/03/17 05:03hrs, lat 28 35.21'S, long 179 41,51'W, depth 1015m

total volume: few rocks

Comments: clast and cobbles of volcanic material, heavily altered but with fresh cores

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR97-1	1. Rock Type: volcanic, altered, andesitic 2. Size: 13x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyritic, weakly vesicular <1% <2mm 6. Phenocrysts: Fsp 10% <3mm, relatively fresh; Px 5% <2mm fresh 7. Matrix: fine grained 8. Secondary Minerals: vesicle fillings Qtz or CC 9. Encrustations: thin Mn crust 3mm	x_air freight box	x	2				GNS	
SO255-DR97-2	1. Rock Type: volcanic, fresh core, altered rim, andesitic 2. Size: 19x16x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey core, brownish - green rim 5. Texture / Vesicularity: porphyritic, weakly altered part few open vesicles 6mm 6. Phenocrysts: Fsp / Px intergrowth 20% <4mm fresh 7. Matrix: fine grained 9. Encrustations: Mn coating	x_air freight box	x	1-2				GNS	
SO255-DR97-3	1. Rock Type: volcanic, altered rim, andesitic 2. Size: 12x8x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey, rim brownish 5. Texture / Vesicularity: porphyritic, few vesicles <2% <1mm 6. Phenocrysts: Fsp / Px intergrowth 15-20% <5mm 7. Matrix: fine grained 9. Encrustations: thin Mn crust <2mm 10. Comment: similar to -2	x_air freight box	x						
SO255-DR97-4	1. Rock Type: volcanic, altered, andesitic, core fresh 2. Size: 8x8x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: core light grey, rim brownish 5. Texture / Vesicularity: porphyritic, dense 6. Phenocrysts: Fsp / Px intergrowth 15-20% <4mm 7. Matrix: fine grained 9. Encrustations: Mn crust <1mm 10. Comment: similar to -3 and -2	x_air freight box	x						
SO255-DR97-5	1. Rock Type: volcanic, altered 2. Size: 10x8x2cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyritic, vesicularity ~20% <3mm 6. Phenocrysts: Px <10% <2mm, Fsp <5% <2mm 7. Matrix: fine grained 8. Secondary Minerals: CC? vein <6mm, some vesicles arr filled with transparent crystals zeolithe? 9. Encrustations: thin Mn crust <1mm	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR97-6	1. Rock Type: volcanic, altered 2. Size: 8x8x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish - reddish 5. Texture / Vesicularity: porphyritic, vesicularity ~5% <1mm 6. Phenocrysts: Plg 5% <4mm, Px 3% <4mm 7. Matrix: fine grained	x							
SO255-DR97-7	1. Rock Type: volcanic, altered 2. Size: 12x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: rim greenish, core light grey 5. Texture / Vesicularity: porphyritic, no vesicules 6. Phenocrysts: Fsp/Px glomerocrystic 10% <3mm 7. Matrix: fine grained 9. Encrustations: thin Mn crust <1mm 10. Comment: similar to -2, -3 and -4; sediment attached	x	x						
SO255-DR97-8	1. Rock Type: volcanic, fairly large fresh core, discovered late while cutting up rocks 2. Size: 21x20x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish grey rim, light grey core 5. Texture / Vesicularity: porphyritic, vesicularity <10% <4mm 6. Phenocrysts: Fsp / Px glomerocrysts 10% <3mm 7. Matrix: fine grained 9. Encrustations: Mn crust <1mm 10. Comment: similar to -2, -3, -4 and -7	x	x					GNS	

SO255-DR98

Description of Location and Structure: Colville Ridge; northern section. 1.5nm NE of DR97, SE facing fault? Scarp, upper 2/3 of slope till top

Dredge on bottom UTC 26/03/17 06:19hrs, lat 28 34.24'S, long 179 40,43'W, depth 1034m

Dredge off bottom UTC 26/03/17 09:31hrs, lat 28 33.94'S, long 179 40,43'W, depth 710m

total volume: 1/4 full

Comments: several altered lava fragements, porphyric with variable amounts of Plg and Px. -3 and -5 are lava clasts recovered from a volcanic breccia similar to -7

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR98-1	1. Rock Type: highly mineral phyric lava 2. Size: 38x21x20cm original size of block H, sample half 19x17x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey - pinkish red - greenish 5. Texture / Vesicularity: porphyritic, dense lava 6. Phenocrysts: Fsp rich 10% <5mm ø, Px 5% <5mm ø; overall crystal content 30-40% 7. Matrix: fine grained 8. Secondary Minerals: matrix oxidized and potentially chloritized (greenish) 9. Encrustations: mm veneer of Mn oxide 10. Comment: appears to be a melt that accumulated high amounts of crystals maybe from crystal mush	x_air freight box	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR98-2	1. Rock Type: volcanic, porphyric lava 2. Size: 30x9x17cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey - brownish - olive green 5. Texture / Vesicularity: porphyritic, vesicular lava, vesicles <5mm, mainly filled with secondary minerals 6. Phenocrysts:mainly Px and Fsp bearing; Px <3mm ø ~15%; Fsp 10% <2mm ø 7. Matrix: fine grained altered matrix 8. Secondary Minerals: greenish and white brownish vesicle infill; 50% of vesicles are filled 9. Encrustations: very little Mn oxides 10. Comment: similar to -1 but more vesicle rich and probably even more altered ---> requires careful preparation	x_air freight box	x					GNS	
SO255-DR98-3	1. Rock Type: volcaniclastic with 2.5x6x10cm lava clast 2. Size: 14x6x10cm 3. Shape / Angularity: rounded 4. Color of cut surface: olive green lava; multicolored volcaniclastics 5. Texture / Vesicularity: porphyritic, dense lava, cracked with filled cracks 6. Phenocrysts: Fsp 3% <4mm; Px ~10% <4mm 7. Matrix: fine grained altered matrix 8. Secondary Minerals: CC vein infilling crack, some secondaries 9. Encrustations: very little Mn oxides 10. Comment: strongly altered lava clast	x_air freight box	x						
SO255-DR98-4	1. Rock Type: volcanic, dense lava 2. Size: 13x7x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: olive-green, grey 5. Texture / Vesicularity: porphyritic, dense lava, cracked infilled with Mn oxide and CC 6. Phenocrysts: Fsp 3% <2mm ø; Px ~4% <2mm ø 7. Matrix: fine grained 8. Secondary Minerals: CC and Mn oxide vein fill 9. Encrustations: some Mn oxides 10. Comment: strongly altered lava; usable?	x_air freight box	x						
SO255-DR98-5	1. Rock Type: two lava clasts from volcanic breccia 2. Size: 23x5.5x11.5cm 10. Comment: similar to -2 through -4								
SO255-DR98-6	1. Rock Type: volcanic, highly porphyric lava 2. Size: 15x6.5x9cm 3. Shape / Angularity: rounded 4. Color of cut surface: grey - pinkish - red - greenish 5. Texture / Vesicularity: porphyritic, dense lava 6. Phenocrysts: Fsp rich ~10% <3mm ø; Px ~15% <4mm ø 7. Matrix: fine grained 8. Secondary Minerals: some secondries replacing minerals 9. Encrustations: some Mn oxides 10. Comment: altered similar to -1	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR98-7	1. Rock Type: volcanic breccia 2. Size: 12x7x3cm 3. Shape / Angularity: rounded 4. Color of cut surface: multicolored but pale brown in dominant 5. Texture / Vesicularity: largest clast 4mm, granular 7. Matrix: coarse grained <4mm clast 10. Comment: volcaniclastic breccia similar to the one holding clast sample -3 and -5								

SO255-DR99

Description of Location and Structure: Colville Ridge; northern section. Split seamount NW portion. E-W striking ridge, S-facing slope from bottom to top, 3nm E of DR98

Dredge on bottom UTC 26/03/17 12:40hrs, lat 28 31.95'S, long 179 36,25'W, depth 1217m

Dredge off bottom UTC 26/03/17 13:52hrs, lat 28 31.83'S, long 179 36,22'W, depth 1097m

total volume: few rocks

Comments: volcaniclastic rocks with larger volcanic clasts that may be suitable for geochemistry but require extra careful preparation

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR99-1	1. Rock Type: volcaniclastic, altered breccia 2. Size: 37x25x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: red-brown, grey-blue, light brown 5. Texture / Vesicularity: polymectic, rim vesiculated up to 3mm 7. Matrix: fine grained, 50% matrix (red brown) 9. Encrustations: 5cm Mn crust 10. Comment: largest clast 8x9.5cm 50% clasts, all altered volcanics	x_air freight box	x					GNS	
SO255-DR99-2	1. Rock Type: volcaniclastic, altered breccia 2. Size: 14x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: red-brown, grey-blue 5. Texture / Vesicularity: polymectic 7. Matrix: fine grained, 60% matrix (red brown) 8. Secondary Minerals: pyrite 9. Encrustations: 3mm Mn crust 10. Comment: largest clast 2x1.5cm 40% clasts, all altered volcanics	x_air freight box	x						
SO255-DR99-3	1. Rock Type: volcaniclastic, altered breccia 2. Size: 13x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: red-brown, grey-blue 5. Texture / Vesicularity: polymectic 7. Matrix: fine grained, 55% matrix (red brown) 8. Secondary Minerals: pyrite <1% 9. Encrustations: <1mm Mn crust 10. Comment: largest clast 3.5x2.5cm; clasts are all altered volcanics	x_air freight box	x						

SO255-NET100

Description of Location and Structure: Colville Ridge

Start UTC 26/03/17 14:41hrs, lat 28 31.22'S, long 179 35,67'W, depth 1260m

On deck UTC 26/03/17 16:19hrs, lat 28 30.74'S, long 179 35,19'W, depth 1353m

SO255-DR101

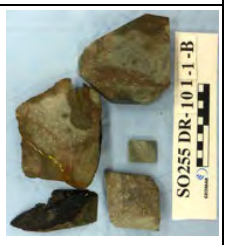
Description of Location and Structure: Colville Ridge; northern section. Split seamount, Western plateau half, SE facing fault? slope. Track across small ridge.

Dredge on bottom UTC 26/03/17 16:??hrs, lat 28 32.99'S, long 179 38,92'W, depth 879m

Dredge off bottom UTC 26/03/17 17:18hrs, lat 28 32.73'S, long 179 38,84'W, depth 708m

total volume: few rocks

Comments: conglomerate containing large rounded clasts of porphyric lava. Large block H (37x70x24cm) delivered several clasts labelled -1A through -1F

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR101-1A	1. Rock Type: volcanic, large lava? clast, partially altered, recovered from block H 2. Size: 23x17x15cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Fsp 40% <4mm, intergrown Px 10% <1mm in Fsp, partly fresh partly altered (green and red staining) 7. Matrix: fine grained, dense 8. Secondary Minerals: brown alteration in matrix, red-brown grains partly within Fsp 9. Encrustations: thin Mn coating 10. Comment: magnetic ---> abundant MT in matrix?	x_air freight box	x	2-3				GNS	
SO255-DR101-1B	1. Rock Type: volcanic, large lava clast, weakly altered, recovered from block H 2. Size: 25x18x18cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Fsp 40% <3mm, fresh to weakly altered greenish color; few mafic grains Px or MT <1% <1mm 7. Matrix: fine grained, dense 8. Secondary Minerals: brown alteration in matrix, red-brown grains partly within Fsp 9. Encrustations: thin Mn coating 10. Comment: magnetic ---> abundant MT in matrix?	x_air freight box	x	2-3					
SO255-DR101-1C	1. Rock Type: volcanic clast within matrix of block H 2. Size: 18x10x9cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Fsp 40%, partly intergrown Px <5mm 7. Matrix: fine grained, dense 8. Secondary Minerals: brown alteration in matrix, red-brown grains partly within Fsp 9. Encrustations: thin Mn coating 10. Comment: magnetic			2					
SO255-DR101-1D	1. Rock Type: volcanic clast from block H, weakly altered 2. Size: 21x19x12cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Fsp 40% partly altered, partly intergrown <4mm in Fsp, partly fresh partly altered (green and red staining) 7. Matrix: fine grained, dense 8. Secondary Minerals: CC and Mn filling of veins 9. Encrustations: thin Mn coating 10. Comment: magnetic	x_air freight box	x	2					

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR101-1E	1. Rock Type: volcanic clast from block H, weakly altered 2. Size: 6x4x3cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Fsp 40% <3mm, partly fresh partly altered, Fe minerals 7. Matrix: fine grained, dense 8. Secondary Minerals: red iron staining 9. Encrustations: thin Mn coating 10. Comment: very fresh Fsp, magnetic	x_air freight box		1					
SO255-DR101-1F	1. Rock Type: volcaniclastic, various sized clasts in matrix, variably altered 2. Size: 19x12x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: non-vesicular, brecciated 7. Matrix: fine grained 8. Secondary Minerals: CC veins and red Fe staining 9. Encrustations: thin Mn coating 10. Comment: two slabs, no individual clasts prepared							GNS	
SO255-DR101-2	1. Rock Type: large subrounded clast without matrix, volcanic weakly altered 2. Size: 20x14x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, non-vesicular 6. Phenocrysts: Fsp 40% 2-3mm fresh 7. Matrix: fine grained 8. Secondary Minerals: red green matrix, spotted, white vesicular fillings in patches CC or silica 9. Encrustations: thin Mn coating 10. Comment: magnetic. Most clasts of sample -1 are identical to -2. Given their subrounded appearance the source area appears proximal	x_air freight box	x	2				GNS	

SO255-DR102

Description of Location and Structure: Havre Trough; immediately E of flat, deep part of the basin. NE-SW streching ridges; southern of one of these ridges dredged slightly oblique to S facing slope

Dredge on bottom UTC 26/03/17 22:05hrs, lat 28 49.86'S, long 178 52,39'W, depth 2131m

Dredge off bottom UTC 26/03/17 23:04hrs, lat 28 49.56'S, long 178 52,32'W, depth 1843m

total volume: few rocks

Comments: small pieces of pumice only, no samples taken

SO255-DR103

Description of Location and Structure: Havre Trough; E of deep flat portion of the basin. NE-SW trending ridge 5nm S of DR102 as repeat. SW termination of ridge, SW facing slope bottom to top

Dredge on bottom UTC 27/03/17 01:17hrs, lat 28 54.74'S, long 178 52,25'W, depth 2168m

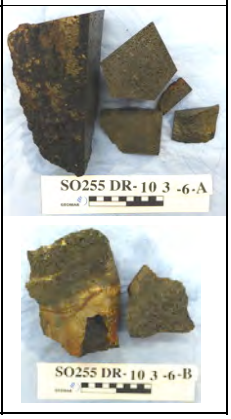
Dredge off bottom UTC 27/03/17 02:37hrs, lat 28 54.41'S, long 178 52,00'W, depth 1825m

total volume: few rocks

Comments: one large block of pillow lava and additional pillow fragments. All fresh Ol basalt with glassy rims.

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR103-1	1. Rock Type: volcanic, Ol basalt, fresh 2. Size: 21x18x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, moderate vesicular 25% <5mm partly filled with sediment 6. Phenocrysts: Ol 10% <3mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: ~1cm fresh glassy rim, some palagonite, glass slab cut off	x_air freight box	x		GL		GC in air-freight box	GNS	
SO255-DR103-2	1. Rock Type: volcanic, Ol basalt, fresh 2. Size: 17x14x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, highly vesicular 35% <8mm partly filled with grey sediment 6. Phenocrysts: Ol 15% <3mm fresh, few larger Ol crystals ~6mm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: ~8mm fresh glassy rim, some palagonite, glass slab cut off	x_air freight box	x		GL				
SO255-DR103-3	1. Rock Type: volcanic, Ol basalt, fresh 2. Size: 13x9x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, moderate vesicular 25% <6mm partly filled with beige sediment 6. Phenocrysts: Ol 10% <3mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: ~1cm fresh glassy rim, some palagonite, glass slab cut off	x	x		GL				
SO255-DR103-4	1. Rock Type: volcanic, Ol basalt, fresh 2. Size: 14x11x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, moderate vesicular 25% <5mm partly filled with brown sediment 6. Phenocrysts: Ol 10% <4mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: ~5mm glassy rim, glass slab cut off, some cracks in matrix	x			GL				
SO255-DR103-5	1. Rock Type: volcanic, Ol basalt, fresh 2. Size: 10x9x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, moderate vesicular 30% <5mm partly filled with sediment 6. Phenocrysts: Ol 7% <3mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: thin glassy rim ~5mm, glass slab cut off	x			GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR103-6	1. Rock Type: volcanic, Ol basalt, fresh 2. Size: block R, pillow, original size 47x38x27cm, broken up into pieces A through E and sampled as such; physically they are all from the same pillow 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, highly vesicular 35% <1cm partly filled with sediment 6. Phenocrysts: Ol 15% <5mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn crust 10. Comment: thin glassy rim cut off from pieces A, B and C. sample A through E are pieces of the same pillow lava (block R), piece C through E not shown	x_air freight box	x		GL		GC of -6A in air-freight box	GNS from piece -C	

SO255-DR104

Description of Location and Structure: Havre Trough; E of deep flat basin. Circular, cone shaped seamount within larger NE-SW striking plateau; S slope upper 2/3 to very top.

Dredge on bottom UTC 27/03/17 05:39hrs, lat 28 58.09'S, long 178 44,36'W, depth 1609m

Dredge off bottom UTC 27/03/17 06:50hrs, lat 28 57.68'S, long 178 44,20'W, depth 1291m

total volume: 1/3 full

Comments: Sample -1 through -9 fresh pillow lava with glass; Plg-Px-Ol phyric in variable proportions, sample-10 is a near aphyric Plg-Px

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR104-1	1. Rock Type: volcanic, pillow basalt, fresh minerals 2. Size: 26x20x17 original size of block D, sampled piece 14x13x17cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 25% up to 4mm 6. Phenocrysts: Plg 5% up to 4mm; Px 4% up to 8mm; Ol 2% up to 4mm; Ol/Px glomerocrysts up to 4mm 7. Matrix: fine grained 9. Encrustations: glass rim 3mm; 1mm Mn crust	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR104-2	1. Rock Type: volcanic, basalt, fresh minerals 2. Size: 54x48x20 original size of block T, sampled pieces 21x17x15cm, 15x14x10cm, 11x13x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 25% 6. Phenocrysts: Px/Ol glomerocrysts 5% up to 5mm; Plg/Ol glomerocrysts 1% up to 2mm; Px 2% up to 2mm; Plg 3% up to 4mm; all phenocryts are fresh 7. Matrix: fine grained 9. Encrustations: glass rim 4mm; <1mm Mn crust	x	x					GNS	
SO255-DR104-3	1. Rock Type: volcanic, basalt, fresh 2. Size: 38x25x24 original size of block R, sampled piece 18x20x17cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% up to 5mm 6. Phenocrysts: Fsp 1% <1mm; Ol <1% <1mm; Px <1% <1mm 7. Matrix: fine grained 9. Encrustations: glass rim 1mm; 2mm Mn crust	x_air freight box	x				GC in air-freight box	GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR104-4	1. Rock Type: volcanic, pillow basalt, fresh minerals 2. Size: 29x15x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% 6. Phenocrysts: Px/Ol glomerocrysts 5% <5mm; Plg 5% <3mm; Px 5% <4mm 7. Matrix: fine grained 9. Encrustations: 2.5cm red oxidized volcanic breccia, clasts <4mm, 1mm Mn crust, could be an intrapillow hyaloclastite	x_air freight box	x					TS-Box 1-63	GNS	
SO255-DR104-5	1. Rock Type: volcanic, basalt, fresh minerals 2. Size: 20x18x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 30% <3mm 6. Phenocrysts: Px/Ol glomerocrysts 5% <5mm; Plg/Ol/Px glomerocrysts 2% <4mm 7. Matrix: fine grained 9. Encrustations: glass rim 4mm; <1mm Mn crust	x	x					GNS	
SO255-DR104-6	1. Rock Type: volcanic, pillow basalt, fresh minerals 2. Size: 22x18x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% 6. Phenocrysts: Px/Ol glomerocrysts 5% <6mm; Px 4% <2mm; Fsp 3% <3mm 7. Matrix: fine grained 9. Encrustations: 4cm oxidized brecciated volcanilclastic, clasts <8mm, 1mm Mn crust	x	x					GNS	
SO255-DR104-7	1. Rock Type: volcanic, basalt, fresh minerals 2. Size: 13x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 25% <5mm 6. Phenocrysts: Px/Ol/Fsp glomerocrysts 7% <5mm; Fsp 2% <4mm; all phenocryts are fresh 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x_air freight box	x				TS-Box 1-63		
SO255-DR104-8	1. Rock Type: volcanic, basalt, fresh minerals 2. Size: 13x9x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicules 15% 6. Phenocrysts: Plg/Px/Ol glomerocrysts 7% <5mm; Fsp 3% <3mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x	x					GNS	
SO255-DR104-9	1. Rock Type: volcanic, pillow basalt, fresh minerals 2. Size: 14x10x10cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 25% 6. Phenocrysts: Plg 10% up to 5mm; Ol 5% <1mm; Px 5% <2mm; rare glomerocrystic Px/Ol 7. Matrix: fine grained 8. Secondary Minerals: rarely vesicles filled by soft sediments 9. Encrustations: 1mm Mn crust								

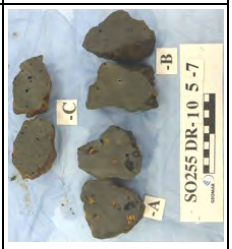
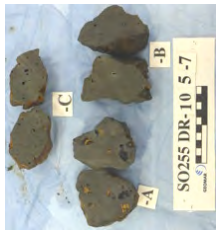
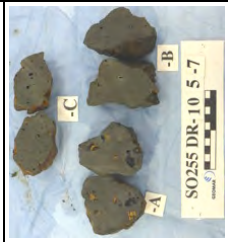
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR104-10	1. Rock Type: volcanic, basalt, fresh minerals 2. Size: 15x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10-15% 6. Phenocrysts: Px 1% <1mm; Plg <1% <1mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x_air freight box	x					GNS	
SO255-DR104-11	1. Rock Type: volcanic, dacite-rhyolite, fresh, pumice 2. Size: 8x8x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: whitish grey 5. Texture / Vesicularity: porous, vesicles 20% 6. Phenocrysts: mafic min. Amph <1mm, invisible felsic minerals, reflective 7. Matrix: fine grained glassy 10. Comment: pumice								

SO255-DR105

Description of Location and Structure: Havre Trough; 2nd northern profile, eastern boundary of cone / ridge field, NE-SW striking fault scarp, track along SE facing slope.

Dredge on bottom UTC 27/03/17 09:34hrs, lat 28 59.18'S, long 178 32,24'W, depth 2211m
Dredge off bottom UTC 27/03/17 10:41hrs, lat 28 58.91'S, long 178 32,14'W, depth 1916m
total volume: few rocks
Comments: Px phyric pillow lava, fresh, no glass described, 1mm Mn crust

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR105-1	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 42x34x25 original size of block K, sampled piece 14x13x22cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black, dark grey 5. Texture / Vesicularity: porphyric, vesicles 15-20% <4mm 6. Phenocrysts: Px 5-10% <1mm; Fsp? <2% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust but not completely covered	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR105-2	1. Rock Type: volcanic, basalt, fresh lava 2. Size: 12x11x8 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 20% <7mm 6. Phenocrysts: Px <5% <3mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust but not completely covered	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR105-3	1. Rock Type: volcanic, basalt, fresh lava 2. Size: 10x8x4 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: near aphyric, vesicles ~5% <6mm 6. Phenocrysts: Px 5% <1mm 7. Matrix: fine grained	x_air freight box	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR105-4	1. Rock Type: volcanic, basalt, fresh lava 2. Size: 8x8x6 original 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric to apyric, vesicles 7-10% <2mm 6. Phenocrysts: Px <5% <1mm 7. Matrix: fine grained	x	x						
SO255-DR105-5	1. Rock Type: volcanic, fresh lava 2. Size: 7x4x7 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 10% <4mm 6. Phenocrysts: Px 3-5% <2mm 7. Matrix: fine grained	x							
SO255-DR105-6	1. Rock Type: volcanic, pillow lava fresh with volcaniclastics attached 2. Size: 11x8x5 3. Shape / Angularity: subangular 4. Color of cut surface: basalt dark grey; volcaniclastic yellowish brown 5. Texture / Vesicularity: basalt 15 % vesicles & fractures; volcaniclastic lapilli tuff 6. Phenocrysts: basalt = aphyric Ol? Px micro-phenocrysts <5% <1mm 7. Matrix: basalt = fine grained; volcaniclastic = tuffaceous 10. Comment: <1mm Mn crust								
SO255-DR105-7A	1. Rock Type: volcanic, fresh pillow lava 2. Size: 8x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: aphyric, vesicles 5% up to 4-5cm ø 6. Phenocrysts: Px 3-5% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust							GNS	
SO255-DR105-7B	1. Rock Type: volcanic, fresh pillow lava 2. Size: 8x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: vesicles 5%, fractures 6. Phenocrysts: aphyric, Ol? Px mircrophenocrysts <5% ~0.5mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust								
SO255-DR105-7C	1. Rock Type: volcanic, fresh pillow lava 2. Size: 8x6x4cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: aphyric, vesicles 5%, fractures 6. Phenocrysts: aphyric Ol? Px microphenocrysts <5% ~0.5mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: similar almost same to -7B								

SO255-DR106

Description of Location and Structure: Havre Trough; near volcanic front, SW flank of small cone WNW of Raoul island

Dredge on bottom UTC 27/03/17 14:21hrs, lat 29 7.93'S, long 178 16,65'W, depth 1153m
Dredge off bottom UTC 27/03/17 15:35hrs, lat 29 7.56'S, long 178 16,52'W, depth 844m
total volume: 1/3 full
Comments: fresh to slightly altered lava, Plg-Px lava throughout

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR106-1	1. Rock Type: volcanic, basalt, fresh lava 2. Size: 37x26x24cm original size of block T, sampled piece 21x19x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 10% <4mm 6. Phenocrysts: Plg 10-15% <4mm; Px <5% <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust but not entirely covered 10. Comment: fresh Plg	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR106-2	1. Rock Type: volcanic, basalt, fresh lava 2. Size: 62x24x30cm original size of block K, sampled piece 21x19x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20% <4mm 6. Phenocrysts: Plg 10-15% <3mm; Px <5% <2mm 7. Matrix: fine grained 10. Comment: fresh Plg similar to -1	x_air freight box	x					GNS	
SO255-DR106-3	1. Rock Type: volcanic, basalt, very slightly altered 2. Size: 20x16x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20% <1mm 6. Phenocrysts: Plg 15% <4mm; Px <5% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust but not entirely covered 10. Comment: fresh Plg	x	x					GNS	
SO255-DR106-4	1. Rock Type: volcanic, basalt, fresh lava 2. Size: 22x18x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20-25% <7mm 6. Phenocrysts: Plg 10% <5mm; Px ~3% <4mm 7. Matrix: fine grained 10. Comment: fresh Plg	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR106-5	1. Rock Type: volcanic, basalt, fresh lava 2. Size: 23x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey to black 5. Texture / Vesicularity: porphyric, vesicles 10-15% <5mm 6. Phenocrysts: Plg 15% <4mm; Px <5% <5mm 7. Matrix: fine grained 10. Comment: fresh Plg	x	x					GNS	
SO255-DR106-6	1. Rock Type: volcanic, fresh lava 2. Size: 15x12x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey to black 5. Texture / Vesicularity: porphyric, vesicles 15% <4mm 6. Phenocrysts: Plg 15% <3mm; Px <3% <3mm 7. Matrix: fine grained 10. Comment: fresh minerals								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR106-7	1. Rock Type: volcanic, fresh lava 2. Size: 14x10x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Px 2% <4mm; glomerocrystic Px/Fsp <5% <3mm 7. Matrix: fine grained	x_air freight box	x					GNS	
SO255-DR106-8	1. Rock Type: volcaniclastic, big clast 2. Size: 20x16x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: beige 5. Texture / Vesicularity: vesicles 20% 6. Phenocrysts: Plg & Px in clast 7. Matrix: fine grained sediment 10. Comment: biggest clast 6x5cm							GNS	
SO255-DR106-9	1. Rock Type: sediment with volcaniclastic and biogene material 2. Size: 12x9x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: vesicles in volcaniclastic material 5% 7. Matrix: calcareous matrix 10. Comment: altered, biology in it								

SO255-DR107

Description of Location and Structure: Eastern Havre Trough; western termination of ridge structure extendending from volcanic front into Havre Trough. South facing slope from bottom to top.

Dredge on bottom UTC 27/03/17 18:57hrs, lat 29 9.48'S, long 178 25,92'W, depth 1791m
Dredge off bottom UTC 27/03/17 15:35hrs, lat 29 9.22'S, long 178 25,90'W, depth 1505m
total volume: few rocks
Comments: two large volcanic blocks, some smaller sedimentary rocks and pumice. Plg-Px phyric lava appears to be more evolved and of andesitic to dacitic composition. Overall fresh to weakly altered.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR107-1	1. Rock Type: volcanic, andesite-dacite, fresh 2. Size: 30x22x22cm original size of block D 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, moderate vesicular 8% <1cm, open partly filled with sediment 6. Phenocrysts: Fsp 7% <2mm; Px <1% <1mm; Amph? 7. Matrix: fine grained, flow texture 9. Encrustations: thin 2mm Mn coating 10. Comment: viscous lava flow, differentiated lava composition	x_air freight box	x	2			GC in air-freight box	GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR107-2A, -B, C	1. Rock Type: volcanic, andesite-dacite, fresh to weakly altered 2. Size: 28x24x17cm original size of block M, sampled pieces A: 13x10x9cm; B: 18x11x10cm; C: 17x16x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey to grey 5. Texture / Vesicularity: porphyric, moderate vesicular 7% <1cm, open 6. Phenocrysts: Fsp 7% <3mm; Px <1% <1mm; partial intergrowth of Px into Fsp 7. Matrix: fine grained, flow texture 9. Encrustations: thin Mn coating 10. Comment: block M smashed up -A,-B and -C pieces, viscous lava flow. -C is lighter in color and seems more altered than -A and -B	x of -A,-B and C_air freight box	x	2				GNS; piece of B & C	

SO255-CTD108

Description of Location and Structure: Eastern Havre Trough

Start UTC 27/03/17 22:35hrs, lat 29 25.63'S, long 178 37,46'W, depth 2321m
On deck UTC 27/03/17 23:01hrs, lat 29 25.62'S, long 178 37,48'W, depth 2326m

SO255-DR109

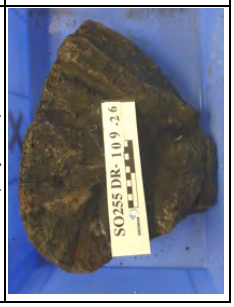
Description of Location and Structure: Havre Trough; western section half way between deep flat basin and volcanic front. NE-SW striking ridge, SE facing flank from bottom to top

Dredge on bottom UTC 28/03/17 00:00hrs, lat 29 25.63'S, long 178 37,46'W, depth 2330m
Dredge off bottom UTC 28/03/17 01:28hrs, lat 29 25.22'S, long 178 37,39'W, depth 1860m
total volume: 3/4 full
Comments: pillow lava, very fresh, abundant glass crusts, fairly aphyric, minor Ol. Petrographycally the lava looked very uniform therefore it is somewhat surprising that from sample -5 onwards (after shift change) Plag and Px are also desribed but only little to none Ol.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR109-1	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 22x18x13cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity 30%, size and amount of vesicles is highly variable, open 6. Phenocrysts: Ol 10% sub-mm to 1mm, fresh 7. Matrix: fine grained 9. Encrustations: thin 2mm Mn coating 10. Comment: very thick glass crust, dense glass. All following samples are of the same lithology / petrography and vary only in the amount of glass, phenocrysts and vesicles	x_air freight box	x		GL-slab		GC in air-freight box	GNS	
SO255-DR109-2	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 21x13x13cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity 30-35%, size and amount of vesicles is highly variable, open 6. Phenocrysts: Ol 10% sub-mm to 1mm, fresh 7. Matrix: fine grained 9. Encrustations: thin 2mm Mn coating 10. Comment: large parts with fresh glass	x	x		GL-slab				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR109-3	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 19x17x12cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity 40%, size and amount of vesicles is highly variable, open 6. Phenocrysts: Ol 10% ~1mm, fresh 7. Matrix: fine grained 9. Encrustations: thin 2mm Mn coating 10. Comment: chilled margin with fresh glass	x	x		GL-slab			GNS	
SO255-DR109-4	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 29x25x22cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity 30%, size and amount of vesicles is highly variable, very few fillings of vesicles 6. Phenocrysts: Ol 5-10% sub-mm to 1mm, fresh 7. Matrix: fine grained 9. Encrustations: thin 2mm Mn coating 10. Comment: large pillow lava fragment with large chilled margin and fresh glass.	x	x		GL-slab			GNS	
SO255-DR109-5	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 19x11x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity 20-25% <5mm 6. Phenocrysts: Fsp 5-10% <1mm, Ol <1% <1mm 7. Matrix: fine grained 10. Comment: partly with fresh glass rind. Comment by FHAUFF; not clear why Fsp is described here and in the following samples since the entire dredge appeared to be lithologically and petrographycally uniform? This needs to be confirmed by reinspection macroscopically and by TS.	x_air freight box	x		GL-slab		GC in air-freight box	GNS	
SO255-DR109-6	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 21x13x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity ~20% <5mm 6. Phenocrysts: Fsp ~10% <1mm; Ol?; Px? 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: 10. Comment: partly with fresh glass rind.	x_air freight box	x		GL-slab			GNS	
SO255-DR109-7	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 22x16x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity ~20% <5mm 6. Phenocrysts: Fsp 5% <1mm, Px ~1% <1mm; Ol? 7. Matrix: fine grained 10. Comment: partly with fresh glass rind.	x_air freight box	x		GL-slab				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR109-8	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 24x17x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity 15-20% <4mm 6. Phenocrysts: Px ~5% <2mm, Fsp ~1% <1mm 7. Matrix: fine grained 10. Comment: partly with fresh glass rind. Glass slab cut off, remaining matrix samples kept, no GC, no TS prepared				GL-slab				
SO255-DR109-9	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 21x14x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity 20% <4mm 6. Phenocrysts: Px ~5% <2mm, Fsp ~1% <1mm, Ol? 7. Matrix: fine grained 10. Comment: partly with fresh glass rind. Glass slab cut off, remaining matrix samples kept, no GC, no TS prepared				GL-slab				
SO255-DR109-10	1. Rock Type: volcanic, pilow lava, fresh 2. Size: 10x14x13cm 3. Shape / Angularity: subangular to subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyrictic, vesicularity 15-20% <4mm 6. Phenocrysts: Fsp ~5% <1mm; Px ~3% <1mm 7. Matrix: fine grained 10. Comment: partly with fresh glass rind. Glass slab cut off, remaining matrix samples kept, no GC, no TS prepared				GL-slab				
SO255-DR109-11 through -21	1. Rock Type: glass slabs cut off from volcanic, pilow lava 7. Matrix: fine grained 10. Comment: only the glass slabs were sampled, the matrix pieces were discarded. only -11 shown				GL-slab				
SO255-DR109-22	1. Rock Type: slice of pillow lava for display 2. Size: -22; 25x25x9cm 7. Matrix: fine grained 10. Comment: for display and teaching. Taken out of blue box for display during open ship Freemantle SO258_060617							display sample	
SO255-DR109-23 through -25	1. Rock Type: various pillow lava flow features 2. Size: 25x25x9cm; 19x12x10cm, 16x13x9cm and 16x11x10cm 7. Matrix: fine grained 10. Comment: some showing multiple layers of glass. Taken out of blue box for display during open ship Freemantle SO258_060617							display sample	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR109-26	1. Rock Type: large pillow with thick glass crust 2. Size: 34x41x29cm 7. Matrix: fine grained 10. Comment: for display and teaching. Packed seperatlely in bubble wrap, does not fit in blue box, planned to display during open ship Freemantle SO258_060617							display sample	

SO255-DR110

Description of Location and Structure: Havre Trough; NW of Giggenbach Seamounts; NE-SW striking ridge, SE flank from base to top

Dredge on bottom UTC 28/03/17 06:33hrs, lat 29 54.66'S, long 178 51,26'W, depth 1832m
Dredge off bottom UTC 28/03/17 07:37hrs, lat 29 54.39'S, long 178 51,51'W, depth 1516m
total volume: 1/2 full
Comments: pumice only

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR110-1	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 20x15x10cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porous, vesicularity 15% 6. Phenocrysts: Amph 5% <1mm; Plg 5% <2mm 7. Matrix: fine grained 10. Comment: dacite?	x_air freight box						GNS	
SO255-DR110-2	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 15x14x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellowish grey 5. Texture / Vesicularity: pumice texture, vesicularity 15% 6. Phenocrysts: Amph 2% <1mm; Plg 1% <1mm 7. Matrix: fine grained 10. Comment: similar to -1							GNS	
SO255-DR110-3	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 13x10x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: pumice texture, vesicularity 20% 6. Phenocrysts: Amph? 2% <1mm; Plg 1% <1mm 7. Matrix: fine grained							GNS	
SO255-DR110-4	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 10x9x8cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: pumice texture, vesicularity 10% 6. Phenocrysts: Amph 10% 2-3mm 7. Matrix: fine grained								
SO255-DR110-5	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 15x14x9cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: pumice texture, vesicularity 5% 6. Phenocrysts: Amph 10% max. 5mm; Plg 5% <3mm 7. Matrix: fine grained 10. Comment: similar to -4	x_air freight box						GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR110-6	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 10x9x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: pumice texture, vesicularity 5% 6. Phenocrysts: Amph 10% <2mm; Plg 5% <1mm 7. Matrix: fine grained 10. Comment: similar to -4 and -5							GNS	
SO255-DR110-7	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 10x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: pumice texture, vesicularity 5% 6. Phenocrysts: Amph 10% <2mm; Plg 5% <1mm 7. Matrix: fine grained 10. Comment: similar to -4 through -6	x_air freight box						GNS	
SO255-DR110-8	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 12x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: pumice texture, vesicularity 7% 6. Phenocrysts: Amph 10% <2mm; Plg 5% <1mm 7. Matrix: fine grained 10. Comment: similar to -4 through -7								
SO255-DR110-9	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 9x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: pumice texture, vesicularity 5% 6. Phenocrysts: Amph 10% max 5mm; Plg 5% <1mm 7. Matrix: fine grained 10. Comment: similar to -4 through -8								
SO255-DR110-10	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 10x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey, partly black 5. Texture / Vesicularity: pumice texture, vesicularity 10% 6. Phenocrysts: Amph 10% <2mm; Plg 5% 7. Matrix: fine grained 10. Comment: similar to -4 through -9 but contains partly black material							GNS	
SO255-DR110-11	1. Rock Type: volcanic, dacitic pumice, fresh 2. Size: 8x5x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: pumice texture, vesicularity 5% 6. Phenocrysts: Amph 10% <2mm; Plg 5% 7. Matrix: fine grained 10. Comment: similar to -4 onwards but contains darker to black portions	x							

SO255-DR111

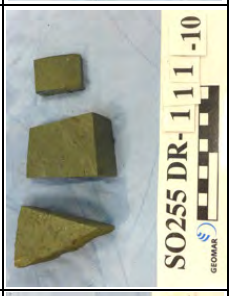
Description of Location and Structure: Havre Trough; Caldera Volcano West of Giggenbach half way to deep, flat portion of the basin. Track along inner caldera wall.

Dredge on bottom UTC 28/03/17 13:26hrs, lat 29 53.97'S, long 179 0,33'W, depth 1452m
Dredge off bottom UTC 28/03/17 14:25hrs, lat 29 53.67'S, long 179 0.32'W, depth 1180m
total volume: few rocks
Comments: fresh to slightly altered dacitic lava fragments with Plg and subordinate Px

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR111-1	1. Rock Type: volcanic, dacitic? lava 2. Size: 7x6x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicularity 10% <2mm 6. Phenocrysts: Plg 10% <4mm 7. Matrix: fine grained	x_air freight box	x				TS box 64-	GNS	
SO255-DR111-2	1. Rock Type: volcanic, dacitic? lava 2. Size: 12x19x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicularity 10% <2mm 6. Phenocrysts: Plg 10% <4mm; Px 2% <1mm 7. Matrix: fine grained	x_air freight box	x						
SO255-DR111-3	1. Rock Type: volcanic, dacitic? lava 2. Size: 14x9x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicularity 15% <1mm 6. Phenocrysts: Plg 10-15% <6mm; Px <2% <1mm often glomerocrystic with Plg 7. Matrix: fine grained 10. Comment: similar to -2	x	x					GNS	
SO255-DR111-4	1. Rock Type: volcanic, dacitic? lava 2. Size: 11x5x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicularity 15% <4mm average 1mm 6. Phenocrysts: Plg 10% <4mm; Px <3% <1mm often forming glomerocrysts with Plg 7. Matrix: fine grained	x	x					GNS	
SO255-DR111-5	1. Rock Type: volcanic, dacitic? lava 2. Size: 8x6x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicularity 10-15% <2mm 6. Phenocrysts: Plg ~10% <3mm; Px <2mm <1mm 7. Matrix: fine grained							GNS	
SO255-DR111-6	1. Rock Type: volcanic, dacitic? lava 2. Size: 12x6x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: bluish grey 5. Texture / Vesicularity: porphyric, vesicularity 25-30% <2mm 6. Phenocrysts: Plg <2% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: older than prev samples due to Mn crust?	x_air freight box	x				TS box 64-	GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR111-7	1. Rock Type: volcanic, dacitic? lava 2. Size: 14x8x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: bluish / greenish grey 5. Texture / Vesicularity: porphyric, vesicularity 5% <4mm 6. Phenocrysts: Plg altered 10-15% <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust not entirely covered 10. Comment: older than prev samples due to Mn crust?	x						GNS	
SO255-DR111-8	1. Rock Type: volcanic, dacitic? lava 2. Size: 25x20x2.5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicularity 10-15% <2mm 6. Phenocrysts: Plg ~5% <5mm; Px <2% <1mm 7. Matrix: fine grained	x_air freight box	x				TS-Box 1-63	GNS	
SO255-DR111-9	1. Rock Type: volcanic, slightly altered dacite 2. Size: 13x7x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: porphyric, vesicularity 10% <4mm 6. Phenocrysts: Plg 10% <5mm; Amph <4% <4mm long 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust, not entirely covered	x_air freight box	x				TS-Box 1-63	GNS	
SO255-DR111-10	1. Rock Type: volcanic, dacitic? lava 2. Size: 13x7x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: porphyric, vesicularity <5% <1mm 6. Phenocrysts: Plg ~10% <4mm; Px? <1% <1mm 7. Matrix: fine grained	x	x					GNS	
SO255-DR111-11	1. Rock Type: volcanic, dacitic? lava 2. Size: 11x5x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: porphyric, vesicularity 10% 6. Phenocrysts: Plg 5% <2mm 7. Matrix: fine grained 8. Secondary Minerals: vesicle infill, yellowish brown altered minerals 10. Comment: very altered; possibly hydrothermal							GNS	
SO255-DR111-12	1. Rock Type: volcanic, dacitic? lava 2. Size: 10x2x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey - black 5. Texture / Vesicularity: porphyric, vesicularity 10% <1mm 6. Phenocrysts: Plg 5% <3mm 7. Matrix: fine grained 8. Secondary Minerals: alteration in vesicles	x						GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR111-13	1. Rock Type: volcanic, altered dacitic? lava 2. Size: 30x17x17cm 3. Shape / Angularity: subangular 4. Color of cut surface: light brown - yellowish 5. Texture / Vesicularity: porphyric 6. Phenocrysts: based on shapes Px 5% <4mm; Plg 7% <5mm 7. Matrix: fine grained 10. Comment: 1cm brecciated rim, 1mm Mn crust	x	x						

SO255-DR112

Description of Location and Structure: Havre Trough; Caldera Volcano West of Giggenbach. Dredge inside caldera NW wall.

Dredge on bottom UTC 28/03/17 15:57hrs, lat 29 54.15'S, long 179 1,33'W, depth 1319m

Dredge off bottom UTC 28/03/17 16:58hrs, lat 29 53.88'S, long 179 1.51'W, depth 1040m

total volume: 1/2 full

Comments: lots of Plg phyric glassy lava. Closer inspection reveals 5 lithological units based on freshness, degree of vesicle filling / lining, encrustation and Plg phenocryst abundance. Group A) highly Fsp phyric with glass -1 to -6; B) -7 & -8 weakly altered angular highly Fsp phyric lava blocks; C) -9 to -12 less Fsp phyric lava group; D) -13 & -14 significantly more altered Plg phyric lava / andesite with fresh core, older?; E) -15 & -16 Mn encrusted Plg phyric lava similar to group A, but appears older due to Mn crust.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR112-1	1. Rock Type: volcanic, andesitic - dacitic composition, fresh 2. Size: 21x18x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, moderate vesicularity 10% <1.5cm, open 6. Phenocrysts: Fsp 35-45% <8mm, fresh, few Px <1% <1mm 7. Matrix: glassy 10. Comment: sample -1 through -6 belong to the fresh, glassy highly Fsp phyric, ball shaped lava unit. Based on freshness this could be the youngest unit	x_air freight box	x				TS box 64-	GNS	
SO255-DR112-2	1. Rock Type: volcanic, andesitic - dacitic composition, fresh 2. Size: 14x13x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, moderate vesicularity 15% <1.5cm, open 6. Phenocrysts: Fsp 40% <8mm, fresh 7. Matrix: glassy 10. Comment: belongs to the fresh, glassy highly Fsp phyric, ball shaped lava unit. Based on freshness this could be the youngest unit	x							
SO255-DR112-3	1. Rock Type: volcanic, andesitic - dacitic composition, fresh 2. Size: 12x9x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, moderate vesicularity 10% <1cm, open 6. Phenocrysts: Fsp 40% <8mm, fresh 7. Matrix: glassy 10. Comment: belongs to the fresh, glassy highly Fsp phyric, ball shaped lava unit. Based on freshness this could be the youngest unit	x							

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR112-4	1. Rock Type: volcanic, andesitic - dacitic composition, fresh 2. Size: 15x9x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, moderate vesicularity 15% <6mm, open 6. Phenocrysts: Fsp 35-45% <8mm, fresh, few Px <1% <1mm 7. Matrix: glassy 10. Comment: belongs to the fresh, glassy highly Fsp phyric, ball shaped lava unit. Based on freshness this could be the youngest unit	x						GNS	
SO255-DR112-5	1. Rock Type: volcanic, andesitic - dacitic composition, fresh 2. Size: 12x10x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, moderate vesicularity 10% <8mm, open 6. Phenocrysts: Fsp 35% <6mm, fresh 7. Matrix: glassy 10. Comment: belongs to fresh, glassy highly Fsp phyric, ball shaped lava unit. Based on freshness this could be the youngest unit	x	x						
SO255-DR112-6	1. Rock Type: 12 smaller pieces; volcanic, andesitic - dacitic composition, fresh 2. Size: from 4x4x4cm to 4x6x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, moderate vesicularity 6. Phenocrysts: Fsp 40% ~6mm, fresh 7. Matrix: glassy 10. Comment: backup material of unit 1	x						Backup	
SO255-DR112-7	1. Rock Type: volcanic, basaltic composition, fresh to weakly altered along rim 2. Size: 39x24x24cm orginal size of block D 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, moderate vesicularity 15% <6mm, partly filled / lined 6. Phenocrysts: Fsp 35% <6mm, fresh; Ol <1% <1mm; Px only few crystals <1mm 7. Matrix: fine grained to glassy 8. Secondary Minerals: altered surface 9. Encrustations: thin Mn coating 10. Comment: belongs to unit 2; weakly altered, angular, larger lava blocks, sample -7 and -8	x_air freight box	x				TS box 64-	GNS	
SO255-DR112-8	1. Rock Type: volcanic, basaltic composition, fresh to weakly altered 2. Size: 28x13x12cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, moderate vesicularity 20% <8mm, partly filled / lined 6. Phenocrysts: Fsp 40% <6mm, fresh; Ol <1% <1mm; Px <1% <2mm 7. Matrix: fine grained to glassy 8. Secondary Minerals: altered surface 9. Encrustations: thin Mn coating 10. Comment: belongs to unit 2; weakly altered, angular, larger lava blocks, sample -7 and -8	x	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR112-9	1. Rock Type: volcanic, basaltic composition, fresh, less phyric unit 3 from -9 to -12 2. Size: 23x20x19cm original size of block K 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, moderate vesicularity 30% total, 15% 1-5mm, 15% <1mm 6. Phenocrysts: Fsp 30% 2-6mm, fresh; Ol <1% <1mm; Px black <1% <1mm, Ol <1% <1mm 7. Matrix: aphyric 8. Secondary Minerals: partly filled vesicles near rims 10. Comment: belongs to unit 3; initially refered to as less phyric group, somewhat surprising that up to 30% large Fsp is described, to be confirmed by TS!	x_air freight box	x	3			TS-Box 1-63	GNS	
SO255-DR112-10	1. Rock Type: volcanic, basaltic composition, mildly altered, less phyric unit 3 from -9 to -12 2. Size: 11x10x6cm original size of block K 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, moderate vesicularity 25% total, 10% 1-4mm, 15% <1mm 6. Phenocrysts: Fsp 10% 1-3mm, fresh; Px black <1% <1mm 7. Matrix: aphyric 8. Secondary Minerals: altered and filled vesicles 10. Comment: belongs to unit 3; refered to as less phyric group, no Ol possibly basaltic andesite to andesite	x	x	3					
SO255-DR112-11	1. Rock Type: volcanic, basaltic andesite slightly altered 2. Size: 13x10x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, moderate vesicularity 35% total, 15% 1-4mm, 10% <1mm 6. Phenocrysts: Fsp 25% 1-4mm, fresh 7. Matrix: aphyric 8. Secondary Minerals: slightly altered vesicles 10. Comment: belongs to unit 3; refered to as less phyric group	x		3					
SO255-DR112-12	1. Rock Type: volcanic, basaltic andesitic, less phyric unit 3 from -9 to -12 2. Size: 24x24x18cm original size of block T 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, moderate vesicularity 40% total, 25% <1mm, 15% ~1mm 6. Phenocrysts: Fsp 25-30% 1-6mm, fresh 7. Matrix: aphyric 8. Secondary Minerals: filled veins 10. Comment: belongs to unit 3; initially refered to as less phyric group	x_air freight box	x	3				GNS	
SO255-DR112-13	1. Rock Type: volcanic, andesitic, tiny fresh core, most groundmass altered to light green, more evolved, altered, older unit 4, sample -13 & -14 2. Size: 20x10x9cm 3. Shape / Angularity: angular 4. Color of cut surface: green 5. Texture / Vesicularity: porphyric, slightly vesicular 10% <5mm partly filled with CC 6. Phenocrysts: Fsp 10% <3mm milky; mafic needle like grains 5% <3mm Amph?/Px? 7. Matrix: fine grained 8. Secondary Minerals: CC in vesicles 9. Encrustations: thin Mn coating 10. Comment: rock type is different from rest of the dredge, more evolved, more altered, unit 4	x_air freight box	x				TS-Box 1-63	GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR112-14	1. Rock Type: volcanic, andesitic, small fresh core, most groundmass altered to light green, more evolved, altered, older unit 4, sample -13 & -14 2. Size: 15x12x12cm 3. Shape / Angularity: angular 4. Color of cut surface: green 5. Texture / Vesicularity: porphyric, slightly vesicular 1% <1mm open 6. Phenocrysts: Fsp 25% <4mm fresh; Px 10% <2mm two types black and green 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: rock type is different from rest of the dredge, more evolved, more altered, unit 4		x of core					GNS	
SO255-DR112-15	1. Rock Type: volcanic, andesitic basalt, weakly altered, especially yellowish encrustation, otherwise similar to unit 1 (-1 to -6) 2. Size: 18x12x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, moderate vesicularity 15% <7mm 6. Phenocrysts: Fsp 35% <6mm, weakly altered - weathered 7. Matrix: fine grained to glassy 9. Encrustations: thin Mn coating and yellowish material 10. Comment: more altered otherwise similar to unit 1	x							
SO255-DR112-16	1. Rock Type: volcanic, andesite, weakly altered, especially yellowish encrustation, otherwise similar to unit 1 (-1 to -6) 2. Size: 15x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, moderate vesicularity 25% <7mm pipe like, partly filled 6. Phenocrysts: Fsp 30% <6mm, weakly altered - weathered 7. Matrix: fine grained to glassy 9. Encrustations: thin Mn coating and yellowish material 10. Comment: more altered otherwise similar to unit 1	x							

SO255-DR113

Description of Location and Structure: Havre Trough central section; small cone-like feature slightly elongated, SE flank from lower slope to top. 4nm NW of caldera volcano

Dredge on bottom UTC 28/03/17 20:37hrs, lat 29 51.65'S, long 179 6,33'W, depth 1567m
Dredge off bottom UTC 28/03/17 21:47hrs, lat 29 51.32'S, long 179 6.51'W, depth 1227m
total volume: few rocks
Comments: several large pillow fragments of Plg phyric lava with very minor Ol. Fresh with glassy rims. Single large pumice

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR113-1	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 28x27x18cm original size of block Q, sample 16x13x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, high vesicularity 30% <3mm, open 6. Phenocrysts: Fsp 15% <5mm, fresh, Ol <1% <1mm fresh 7. Matrix: fine grained 9. Encrustations: thin glassy rim ~3mm 10. Comment: glass rim cut off	x	x	2-3	GL			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR113-2	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 39x22x18cm original size of block N, sample 21x17x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, high vesicularity 30% <4mm, open 6. Phenocrysts: Fsp 20% <5mm, fresh, Ol <2% <1mm fresh 7. Matrix: fine grained 9. Encrustations: thin glassy rim ~3mm 10. Comment: glass rim cut off	x_air freight box	x	2-3	GL		TS box 64-	GNS	
SO255-DR113-3	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 22x20x16cm original size of block F, sample 20x16x16cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, high vesicularity 35% <6mm, open partially filled with sediment 6. Phenocrysts: Fsp 15% <3mm, fresh, Ol <1% <1mm 7. Matrix: fine grained 9. Encrustations: thin glassy rim ~1mm 10. Comment: glass rim cut off	x_air freight box	x	2-3	GL		TS box 64-	GNS	
SO255-DR113-4	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 23x21x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, highly vesicularity 35% <3mm, open 6. Phenocrysts: Fsp 7% <4mm, fresh, Ol <<1% <0.5mm 7. Matrix: fine grained 9. Encrustations: very thin glassy rim <1mm	x	x	2-3					
SO255-DR113-5	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 11x8x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, high vesicularity 30% <5mm, open 6. Phenocrysts: Fsp 20% <5mm, fresh, Ol <3% <1mm 7. Matrix: fine grained 9. Encrustations: thin glassy rim ~3mm			2-3					
SO255-DR113-6	1. Rock Type: volcanic, pumice 2. Size: 43x32x21cm 3. Shape / Angularity: rounded 4. Color of cut surface: pale beige 5. Texture / Vesicularity: glassy strongly vesicular 6. Phenocrysts: Fsp 15% <5mm, fresh, Ol <1% <1mm 7. Matrix: glassy 10. Comment: display sample, will be used in SO258 openship Freemantle 060616. Pumice likely to orginate from 2012 Havre eruption.								

SO255-DR114

Description of Location and Structure: Havre Trough central section; 14nm W of caldera volcano. Small NE-SW elongated ridge, SE facing slope from bottom to top. Structure marks the SW termination the caldera volcano bathymetric anomaly.

Dredge on bottom UTC 29/03/17 00:15hrs, lat 29 51.80'S, long 179 17,01'W, depth 2410m
Dredge off bottom UTC 29/03/17 01:14hrs, lat 29 51.49'S, long 179 17.13'W, depth 2110m
total volume: 1/5 full
Comments: pumice only, two reference pieces taken

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR114-1	1. Rock Type: volcanic, pumice, mildly altered 2. Size: 20x15x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: light brown, wet outside surface 5. Texture / Vesicularity: porous, vesicularity 50% <3cm 7. Matrix: pumiceous. glassy 10. Comment: uncut piece								
SO255-DR114-2	1. Rock Type: volcanic, pumice, fresh 2. Size: 17x11x11cm 3. Shape / Angularity: angular 4. Color of cut surface: grey to light brown, wet outside surface 5. Texture / Vesicularity: porous, vesicularity 35% <2cm 6. Phenocrysts: black neddles y1% <1mm Amph? 7. Matrix: pumiceous. glassy 10. Comment: uncut piece								

SO255-DR115

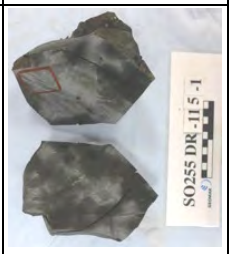
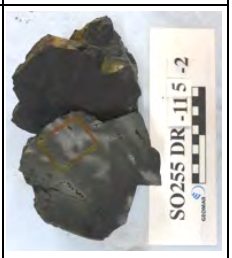
Description of Location and Structure: Havre Trough central section; caldera volcano, S facing outer flank of caldera, mid section to top.

Dredge on bottom UTC 29/03/17 04:05hrs, lat 29 55.79'S, long 179 2,50'W, depth 1618m

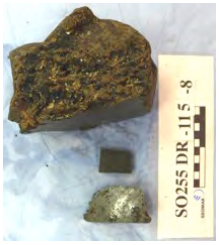
Dredge off bottom UTC 29/03/17 05:18hrs, lat 29 55.88'S, long 179 2.49'W, depth 1260m

total volume: 1/2 full

Comments: 1/3 of recovered rocks are pillow like fragments that resembles obsidian when it breaks, other 2/3 is pumice. -1 to -12 are felsic glassy rocks that resemble obsidian and are probably of rhyolitic composition. Small amounts of Fsp.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR115-1	1. Rock Type: volcanic, vitrous, evolved felsic glass, rhyolitic 2. Size: 21x18x15cm original size of block D, sample piece 16x13.5x9.5cm 3. Shape / Angularity: angular 4. Color of cut surface: black grey 5. Texture / Vesicularity: 15% vesicles <5mm, slightly phyric 6. Phenocrysts: Fsp 3% <3mm 7. Matrix: fine grained 10. Comment: concoidal fractures, fresh	x_air freight box	x				TS box 64-	GNS	
SO255-DR115-2	1. Rock Type: volcanic, vitrous, evolved felsic glass, rhyolitic 2. Size: 29x28x22cm original size of block Q, sample piece 16x11x9cm 3. Shape / Angularity: angular 4. Color of cut surface: black grey 5. Texture / Vesicularity: 7% vesicles <1cm most 2mm, slightly phyric 6. Phenocrysts: Fsp 1% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: concoidal fractures, fresh	x	x					GNS	
SO255-DR115-3	1. Rock Type: volcanic, vitrous, evolved felsic glass, rhyolitic 2. Size: 36x26x18cm original size of block T, sample piece 15x13x11cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: 5% vesicles <4mm, slightly phyric 6. Phenocrysts: Fsp 1% <2mm 7. Matrix: fine grained 10. Comment: concoidal fractures, fresh	x	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR115-4	1. Rock Type: volcanic, felsic glass 2. Size: 20x15x13cm 3. Shape / Angularity: angular 4. Color of cut surface: grey black 5. Texture / Vesicularity: 10% vesicles <7mm, slightly phyric 6. Phenocrysts: Fsp 5% <3mm 7. Matrix: fine grained 10. Comment: fresh	x_air freight box	x				TS box 64-	GNS	
SO255-DR115-5	1. Rock Type: volcanic, rhyolitic felsic glass 2. Size: 20x16x8cm 3. Shape / Angularity: angular 4. Color of cut surface: black grey 5. Texture / Vesicularity: 7% vesicles <8mm, slightly phyric, vitreous 6. Phenocrysts: Fsp 5% <2mm 7. Matrix: fine grained 8. Secondary Minerals: yellowish filling of vesicles	x	x					GNS	
SO255-DR115-6	1. Rock Type: volcanic, rhyolitic, obsidian, felsic glass 2. Size: 29x16x21cm original size of block F, sample piece 14x7x10cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: 10% vesicles <6mm, slightly phyric, vitreous 6. Phenocrysts: Fsp 2% <3mm 7. Matrix: fine grained 8. Secondary Minerals: yellow alteration streaks along vesicles 10. Comment: concoidal							GNS	
SO255-DR115-7	1. Rock Type: volcanic, rhyolitic glass 2. Size: 19x18x12cm 3. Shape / Angularity: angular 4. Color of cut surface: black grey 5. Texture / Vesicularity: 15% vesicles <4mm, slightly phyric 6. Phenocrysts: Fsp 1% <2mm 7. Matrix: fine grained 10. Comment: flow banding, dark to light colored stripes							GNS	
SO255-DR115-8	1. Rock Type: rhyolitic 2. Size: 17x13x9cm 3. Shape / Angularity: angular 4. Color of cut surface: black grey 5. Texture / Vesicularity: 15% vesicles <5mm, slightly phyric 6. Phenocrysts: Fsp 7% <3mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x_air freight box						GNS	
SO255-DR115-9	1. Rock Type: felsic glass, rhyolitic 2. Size: 13x9x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black grey 5. Texture / Vesicularity: 10% vesicles <2mm 6. Phenocrysts: Px? Plg 5% <3mm 7. Matrix: fine grained	x_air freight box						GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR115-10	1. Rock Type: felsic glass, rhyolitic, slightly altered 2. Size: 35x23x34cm original size of block L, sample piece 17x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black grey 5. Texture / Vesicularity: 10% vesicles <2mm, one up to 2cm, slightly phyric 6. Phenocrysts: Fsp 2% <2mm 7. Matrix: fine grained	x	x					GNS	
SO255-DR115-11	1. Rock Type: vfelsic glass, rhyolitic 2. Size: 13x12x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey black 5. Texture / Vesicularity: 10-15% vesicles <6mmc 6. Phenocrysts: Fsp 3% <2mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust, not entirely covered							GNS	
SO255-DR115-12	1. Rock Type: volcanic, felsic glass, rhyolitic, slightly altered 2. Size: 12x17x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: 15-20% vesicles <2mm 6. Phenocrysts: Fsp 5% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR115-13	1. Rock Type: rhyolitic 2. Size: 26x21x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black grey 5. Texture / Vesicularity: 10% vesicles <2mm, slightly phyric 6. Phenocrysts: Fsp 6% <3mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x_air freight box	x				TS-Box 1-63	GNS	
SO255-DR115-14	1. Rock Type: pumice, felsic 2. Size: 22x11x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown grey 5. Texture / Vesicularity: 15% vesicles <6mm 6. Phenocrysts: 1.8x0.7cm mafic lithics 7. Matrix: fine grained	x						GNS	
SO255-DR115-15	1. Rock Type: pumice, felsic 2. Size: 14x10x6cm 3. Shape / Angularity: rounded 4. Color of cut surface: pink - grey - white 5. Texture / Vesicularity: 15% vesicles <3mm 6. Phenocrysts: mafics 3% <3mm 7. Matrix: fine grained								
SO255-DR115-16	1. Rock Type: pumice, felsic 2. Size: 6 pieces 3. Shape / Angularity: subangular 4. Color of cut surface: grey white 5. Texture / Vesicularity: 15% vesicles <10mm, elongated 6. Phenocrysts: Amph 3% <4mm 7. Matrix: fine grained 10. Comment: display sample							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR115-17	1. Rock Type: volcanic, rhyolitic, representative for most samples of dredge, not cut 2. Size: 19x20x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 15% vesicles 7. Matrix: fine grained 10. Comment: display piece, flow direction texture on outer surface. Taken out freom box to be used during SO258 openship Freemantle 060616.							display sample	

SO255-DR116

Description of Location and Structure: Havre Trough, caldera volcano, satellite cone at E rim of caldera, SE facing slope from base of small valley to top

Dredge on bottom UTC 29/03/17 06:56hrs, lat 29 55.73'S, long 178 58,73'W, depth 1516m
Dredge off bottom UTC 29/03/17 08:07hrs, lat 29 55.37'S, long 179 58.87'W, depth 1103m
total volume: 1/3 full
Comments: Fresh, highly Fsp >> Px phyric lava

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR116-1	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 44x47x39cm original size of block F, sample piece 20x14x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 7% vesicles 6. Phenocrysts: Fsp 25% 3-5mm; Px 10% 2mm 7. Matrix: fine grained 10. Comment: Plg - Px phyric basalt	x_air freight box	x				TS box 64-	GNS	
SO255-DR116-2	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 40x23x22cm original size of block D, sample piece A: 15x15x11cm, sample B: 14x11x10cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 5% vesicles 6. Phenocrysts: Fsp 30% 2-4mm; Px 10% 2mm 7. Matrix: fine grained 10. Comment: simlar to -1	x	x					GNS	
SO255-DR116-3	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 22x14x10cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 10% vesicles 6. Phenocrysts: Fsp 30% 3-5mm; Px 10% 3mm 7. Matrix: fine grained 10. Comment: similar -1, -2	x_air freight box	x					GNS	
SO255-DR116-4	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 21x14x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 3% vesicles 6. Phenocrysts: Fsp 25% 2-5mm; Px 10% 2mm 7. Matrix: fine grained 10. Comment: similar to prev. samples	x	x					GNS	
SO255-DR116-5	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 23x13x12cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 15% vesicles 6. Phenocrysts: Fsp 30% ~5mm; Px 10% 2mm 7. Matrix: fine grained 10. Comment: similar to prev. samples	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR116-6	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 20x14x13cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 20% vesicles 6. Phenocrysts: Fsp 25% 3-5mm; Px 10% 3mm 7. Matrix: fine grained 10. Comment: similar to prev samples	x	x					GNS	
SO255-DR116-7	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 15x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 3% vesicles 6. Phenocrysts: Fsp 15% max 1.3cm; Px 15% 4mm 7. Matrix: fine grained	x						GNS	
SO255-DR116-8	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 13x8x7cm original size of block F, sample piece 20x14x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellowish grey 5. Texture / Vesicularity: porphyric, 3% vesicles 6. Phenocrysts: Fsp 20% 3-5mm; Px 15% 2mm; Plg-Px glomerocrysts 7. Matrix: fine grained	x_air freight box	x				TS box 64-	GNS	
SO255-DR116-9	1. Rock Type: volcanic, basalt pillow, fresh 2. Size: 16x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 3% vesicles 6. Phenocrysts: Fsp 15% 3-5mm; Px 10% 2mm 7. Matrix: fine - medium grained	x	x						
SO255-DR116-10	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 9x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 10% vesicles 6. Phenocrysts: Fsp 15% 3-4mm; Px 10% 3-5mm 7. Matrix: fine grained	x							
SO255-DR116-11	1. Rock Type: volcanic, basalt pillow fresh 2. Size: 13x7x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 10% vesicles 6. Phenocrysts: Fsp 20% 3-5mm; Px 5% 3-5mm 7. Matrix: fine grained 10. Comment: similar to -9 & -10								

SO255-DR117

Description of Location and Structure: Havre Trough, southern flank of Giggenbach Complex

Dredge on bottom UTC 29/03/17 10:43hrs, lat 30 5.81'S, long 179 49,74'W, depth 1432m

Dredge off bottom UTC 29/03/17 11:59hrs, lat 30 5.46'S, long 178 49.88'W, depth 1069m

total volume: 3/4 full

Comments: lots of pumice but 4 small pieces of rhyolite. At DR115 rhyolite has been also dredged, at DR118 basaltic pillow so it seems unlikely that DR115 material was still present in dredge or on deck during DR117

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR117-1	1. Rock Type: volcanic, rhyolitic 2. Size: 8x9x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey black 5. Texture / Vesicularity: porphyric, 5% vesicles <7mm 6. Phenocrysts: Fsp 5% <4mm 7. Matrix: fine grained	x_air freight box	x				TS box 64-		
SO255-DR117-2	1. Rock Type: volcanic, rhyolitic 2. Size: 18x18x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: black to grey 5. Texture / Vesicularity: porphyric, 10% vesicles >7mm 6. Phenocrysts: Fsp 10% >4mm 7. Matrix: fine grained 10. Comment: black on one end, grey on other	x_air freight box						GNS	
SO255-DR117-3	1. Rock Type: volcanic, rhyolitic 2. Size: 12x13x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, 15% vesicles >10mm 6. Phenocrysts: Fsp 15% >4mm 7. Matrix: fine grained							GNS	
SO255-DR117-4	1. Rock Type: volcanic, rhyolitic 2. Size: 8x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 7% vesicles <6mm 6. Phenocrysts: Fsp 10% <3mm 7. Matrix: fine grained							GNS	
SO255-DR117-5	1. Rock Type: pumice, felsic 2. Size: 13x23x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey black 5. Texture / Vesicularity: aphyric, flow banding 6. Phenocrysts: lithics 1% 7. Matrix: fine grained	x						GNS	
SO255-DR117-6	1. Rock Type: pumice, felsic 2. Size: 10x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey white 5. Texture / Vesicularity: aphyric, 15% vesicles <1cm 7. Matrix: fine grained								
SO255-DR117-7	1. Rock Type: pumice, felsic 2. Size: 15x7x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, 10% vesicles <4mm 7. Matrix: fine grained 10. Comment: mixing of distinct dark and light colored sources								
SO255-DR117-8	1. Rock Type: pumice, felsic 2. Size: 14x12x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light brown 5. Texture / Vesicularity: aphyric, 10% vesicles <1mm 7. Matrix: fine grained								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR117-9	1. Rock Type: pumice 2. Size: 11x5x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, 7% vesicles <3mm 6. Phenocrysts: mafic lithics 10% <1mm 7. Matrix: fine grained								
SO255-DR117-10	1. Rock Type: pumice, felsic 2. Size: 14x8x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: white grey 5. Texture / Vesicularity: 10% vesicles 6. Phenocrysts: Amph 3% <1mm 7. Matrix: fine grained								
SO255-DR117-11	1. Rock Type: pumice, felsic 2. Size: 52x40x30cm original size of block L; sample piece 16x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: aphyric, 20% vesicles <1cm 7. Matrix: fine grained							GNS	

SO255-DR118

Description of Location and Structure: Havre Trough, central plateau midway between Giggenbach and Havre, SE flank of main structural high

Dredge on bottom UTC 29/03/17 17:00hrs, lat 30 24.09'S, long 179 21,46'W, depth 1715m

Dredge off bottom UTC 29/03/17 18:21hrs, lat 30 23.71'S, long 179 21.52'W, depth 1373m

total volume: 1/5 full

Comments: pillows and pillow lava fragments, all are fresh Ol basalt with fresh glassy margins

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR118-1	1. Rock Type: volcanic, pillow, Ol basalt 2. Size: 37x25x21 original size of block P, sample piece 25x23x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, highly vesicular 30% <12mm, open partly filled with sediment along outer rim 6. Phenocrysts: Ol 20% <4mm fresh 7. Matrix: fine grained 8. Secondary Minerals: palagonite replacing glass 9. Encrustations: glassy rim ~5mm, thin Mn coating 10. Comment: all samples of dredge a very much alike	x_air freight box	x		GL slab			GNS	
SO255-DR118-2	1. Rock Type: volcanic, pillow, Ol basalt 2. Size: 29x24x17cm original size of block Q, sample piece 21x15x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, highly vesicular 30% <5mm, open partly filled with sediment along outer rim 6. Phenocrysts: Ol 20% <4mm fresh 7. Matrix: fine grained 8. Secondary Minerals: palagonite replacing glass 9. Encrustations: glassy rim ~8mm, thin Mn coating 10. Comment: vesicles show cooling horizons	x_air freight box	x		GL slab			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR118-3	1. Rock Type: volcanic, pillow, Ol basalt 2. Size: 15x15x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, highly vesicular 35% <6mm, open partly filled with sediment along outer rim 6. Phenocrysts: Ol 20% <6mm fresh 7. Matrix: fine grained 8. Secondary Minerals: palagonite replacing glass 9. Encrustations: glassy rim ~4mm	x	x		GL slab				
SO255-DR118-4	1. Rock Type: volcanic, pillow, Ol basalt 2. Size: 13x12x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, highly vesicular 25% <3mm, open partly filled with sediment along outer rim 6. Phenocrysts: Ol 20% <5mm fresh 7. Matrix: fine grained 8. Secondary Minerals: palagonite replacing glass 9. Encrustations: glassy rim ~8mm							backup	
SO255-DR118-5	1. Rock Type: volcanic, pillow, Ol basalt 2. Size: 12x9x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, highly vesicular 30% <5mm, open 6. Phenocrysts: Ol 20% <4mm fresh 7. Matrix: fine grained 8. Secondary Minerals: palagonite replacing glass 9. Encrustations: glassy rim ~5mm on both sides ---> sheet flow							backup	

SO255-DR119

Description of Location and Structure: Havre Trough, oval shaped NE-SW bathymetric anomaly in the center of the deep, flat portion of the basin. NE-SW elongated cone 6nm NW of DR118, SE flank from bottom to top. All structures in the anamaly strike NE-SW

Dredge on bottom UTC 29/03/17 20:36hrs, lat 30 19.93'S, long 179 27,03'W, depth 2168m
Dredge off bottom UTC 29/03/17 21:40hrs, lat 30 19.62'S, long 179 27.01'W, depth 1833m
total volume: very few
Comments: mostly pumice, two small rocks. Near aphyric fresh lava with minor Ol and Px

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR119-1	1. Rock Type: volcanic, basalt 2. Size: 25x23x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: near aphyric, highly vesicular 30% <4mm 6. Phenocrysts: Ol 1% <1mm; few Px <1mm 7. Matrix: fine grained 9. Encrustations: glassy rim ~3mm	x_air freight box	x					GNS not clear if -1 or -2 or both	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR119-2	1. Rock Type: volcanic, basalt 2. Size: 6x6x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: near aphyric, highly vesicular 30% <5mm 6. Phenocrysts: Ol 1% <1mm; few Fsp 7. Matrix: fine grained 10. Comment: -1 & -2 bear Ol but -1 also Px whereas -2 has Fsp		x						

SO255-DR120

Description of Location and Structure: Havre Trough, 25nm NW of Havre volcano / caldera. NW termination of bathymetric anomaly stretching from there. NE-SW aligned ridge, S facing flank lower to mid section

Dredge on bottom UTC 30/03/17 01:22hrs, lat 30 40.93'S, long 179 26,49'W, depth 2085m

Dredge off bottom UTC 29/03/17 02:44hrs, lat 30 40.54'S, long 179 26.42'W, depth 1777m

total volume: few rocks

Comments: pillow fragments of fresh Ol-Px phyric lava

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR120-1	1. Rock Type: volcanic, fresh 2. Size: 30x24x19cm original size of block W, sample pieces 19x13x6cm, 15x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicular 25%, some filled with fine grained sediment 6. Phenocrysts: Ol 5-10% ~0.5mm fresh; CPx 10% 0.5-1mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: Mn coating removed by saw from palagonite covering chilled margin	x_air freight box	x		GL			GNS	
SO255-DR120-2	1. Rock Type: volcanic, fresh 2. Size: 18x13x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicular 20-25%, some filled with fine grained sediment 6. Phenocrysts: Ol 10% <1mm fresh; CPx 5% 0.5-1.5mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: Mn coating removed by saw from glassy margin	x_air freight box	x		GL				
SO255-DR120-3	1. Rock Type: volcanic, fresh, two pieces taken as backup 2. Size: 9x7x7cm, 9x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicular 35-40% piece 1, 25% piece 2, in both some v. filled with fine grained sediment 6. Phenocrysts: Ol 10% 0.5-1.5mm fresh; CPx 3% <1mm fresh pice 1, piece 2 Ol 5% <1mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: backup samples	x	x		GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR120-4	1. Rock Type: volcanic, fresh 2. Size: 30x24x19 original size of block W, sample pieces 19x13x6cm, 15x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicular 25%, some filled with fine grained sediment 6. Phenocrysts: Ol 5-10% ~0.5mm fresh; CPx 10% 0.5-1mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: Mn coating removed by saw from palagonite covering chilled margin							back up	

SO255-DR121

Description of Location and Structure: NW termination of bathymetric anomaly stretching from Havre volcano / caldera. Oval shaped conical seamount, SE end along W-facing flank from mid-section to ridge crest

Dredge on bottom UTC 30/03/17 04:29hrs, lat 30 41.95'S, long 179 23,39'W, depth 1734m

Dredge off bottom UTC 30/03/17 06:02hrs, lat 30 41.95'S, long 179 22.93'W, depth 1353m

total volume: few rocks

Comments: Ol-Px lava fragments, overall fresh but no glass

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR121-1	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 30x19x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles ~20% 5mm 6. Phenocrysts: Ol 10-15% <3mm fresh yellowish; Plg 15-20% <5mm, glomerocrystic Ol / Plg <8mm ~5% 7. Matrix: fine grained 9. Encrustations: Mn crust 2-3mm, ~3mm palagonite 10. Comment: fresh Ol, fresh Plg	x_air freight box	x					GNS	
SO255-DR121-2	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 23x22x16cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to black 5. Texture / Vesicularity: porphyric, vesicles ~20% <4mm, some fractures with alteration 6. Phenocrysts: glomerocrysts of Ol / Plg; Ol 5-10% <2mm fresh yellowish; Plg 10% <4mm; Px ~2% <1mm 7. Matrix: fine grained 9. Encrustations: Mn crust 2-3mm, ~3mm palagonite 10. Comment: fairly fresh Ol and Plg	x_air freight box	x					GNS	
SO255-DR121-3	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 14x14x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black to grey 5. Texture / Vesicularity: porphyric, vesicles ~15% <3mm 6. Phenocrysts: some glomerocrysts of Ol / Plg; Ol 10-15% <2mm fresh yellowish; Plg 15% <5mm; Px <1% <1mm 9. Encrustations: Mn crust 2mm, <1mm palagonite 10. Comment: fairly fresh Plg and Px	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR121-4	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 18x13x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black to grey 5. Texture / Vesicularity: porphyric, vesicles ~25-30% <2mm 6. Phenocrysts: Ol ~15% <2mm yellowish; Plg 10% <2mm altered 7. Matrix: fine grained 9. Encrustations: Mn crust 2mm, <2mm palagonite	x	x					GNS	
SO255-DR121-5	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 16x11x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to black 5. Texture / Vesicularity: porphyric, vesicles ~25% ~2mm 6. Phenocrysts: Ol 5-10% <2mm yellowish; Plg 5% <2mm 7. Matrix: fine grained 9. Encrustations: Mn crust 3mm, ~2mm palagonite 10. Comment: bands of different sizes of vesicles	x	x					GNS	
SO255-DR121-6	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 10x10x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to black 5. Texture / Vesicularity: porphyric, vesicles 30-40% <10mm 6. Phenocrysts: Ol <10% <2mm yellowish; Plg 15% <10mm; Px ~1% <2mm, some Ol/Plg glomerocrysts 7. Matrix: fine grained 9. Encrustations: 1mm palagonite 10. Comment: fairly fresh Ol and Plg good visible pillow lava structure on surface							GNS	
SO255-DR121-7	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 15x11x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to black 5. Texture / Vesicularity: porphyric, vesicles ~25-30% <4mm 6. Phenocrysts: Ol <10% <2mm yellowish; Plg 15% <10mm 7. Matrix: fine grained 9. Encrustations: 1mm palagonite 10. Comment: fairly fresh Ol and Plg, good visible pillow structure at surface, similar to -6							GNS	

SO255-DR122

Description of Location and Structure: Central Havre Trough; ridge structure SW striking, flank

Dredge on bottom UTC 30/03/17 09:04hrs, lat 30 47.15'S, long 179 18,68'W, depth 1967m

Dredge off bottom UTC 30/03/17 19:07hrs, lat 30 47.15'S, long 179 18.26'W, depth 1810m

total volume: 1/5 full

Comments: few pillows of fresh Ol bearing lava; one large pillow and few smaller pieces, glass but not separated

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR122-1	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 30x24x22cm original size of block K, sample piece 13x18x9cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 25%, chilled margin with fresh glass 6. Phenocrysts: Ol 10% ~1mm; Px 5% <1mm, glomerophyric Plg 1% <1mm 7. Matrix: fine grained, fresh 9. Encrustations: 5mm glassy margin 10. Comment: fresh Ol, fresh Plg	x_air freight box	x					GNS	
SO255-DR122-2	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 17x15x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20%, chilled margin with fresh glass 6. Phenocrysts: Ol 10% ~2mm; Px 3% <2mm 7. Matrix: fine grained, fresh 9. Encrustations: 5mm glassy margin 10. Comment: similar to -1	x	x					GNS	
SO255-DR122-3	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 20x11x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% 6. Phenocrysts: Ol 15% ~2mm; Px 5% ~3mm, Plg 2% ~1mm 7. Matrix: fine grained, fresh 10. Comment: similar to -1	x_air freight box	x					GNS	
SO255-DR122-4	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 16x14x7cm original size of block K, sample piece 13x18x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10%, chilled margin with fresh glass 6. Phenocrysts: Ol 15% ~5mm; Px 3% ~1mm, Plg 1% <1mm 7. Matrix: fine grained, fresh 9. Encrustations: 5mm glassy margin 10. Comment: simlar to prev samples	x	x					GNS	
SO255-DR122-5	1. Rock Type: volcanic, basaltic pillow lava, fresh 2. Size: 16x14x7cm original size of block K, sample piece 13x18x9cm 3. Shape / Angularity: rounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 5%, chilled margin with fresh glass 6. Phenocrysts: Ol 15% ~2mm; Px 5% ~1mm, Plg 2% ~1mm 7. Matrix: fine grained, fresh 9. Encrustations: 5mm glassy margin 10. Comment: similar to prev. samples	x	x						

SO255-DR123

Description of Location and Structure: Central Havre Trough; small cone ~8nm from DR122, SE flank

Dredge on bottom UTC 30/03/17 12:31hrs, lat 30 53.79'S, long 179 9,22'W, depth 1669m

Dredge off bottom UTC 30/03/17 13:09hrs, lat 30 53.57'S, long 179 8.78'W, depth 1374m

total volume: 1/4 full

Comments: several large and some smaller pillow lava fragments, some scoriaceous and glassy. Mostly Ol-Px phyric with occasional Fsp, fresh

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR123-1	1. Rock Type: volcanic, basalt, fresh 2. Size: 37x30x26cm original size of block P, sample piece 26x13x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% <1.1cm 6. Phenocrysts: Px 7% <4mm; Ol 5% <2mm; Ol/Px glomerocrysts 5% <3mm, Fsp 1% <4mm 7. Matrix: fine grained 10. Comment: very fresh	x_air freight box	x					GNS	
SO255-DR123-2	1. Rock Type: volcanic, basalt, fresh 2. Size: 38x25x19cm original size of block T, sample piece 18x15x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% <3mm 6. Phenocrysts: Px 5% <7mm; Ol 2% <3mm; Ol/Px glomerocrysts 4% <10mm, Fsp 1% <2mm 7. Matrix: fine grained 9. Encrustations: 3mm glass 10. Comment: fresh	x_air freight box	x		GL			GNS	
SO255-DR123-3	1. Rock Type: volcanic, basalt, fresh 2. Size: 25x23x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% <5mm, most 1-2mm 6. Phenocrysts: Px 1% <3mm; Ol/Px glomerocrysts 3% <5mm 7. Matrix: fine grained 9. Encrustations: 3mm glass 10. Comment: fresh	x	x		GL			GNS	
SO255-DR123-4	1. Rock Type: volcanic, basalt, fresh 2. Size: 10x8x8cm 3. Shape / Angularity: bangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% 6. Phenocrysts: Px 7% <6mm; Ol 5% <5mm; Ol/Px glomerocrysts 5% <5mm, Fsp 1% <2mm 7. Matrix: fine grained 10. Comment: fresh	x	x						
SO255-DR123-5	1. Rock Type: volcanic, basalt, fresh 2. Size: 16x12x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% <3mm 6. Phenocrysts: Px 2% <3mm; Ol 2% <3mm; Ol/Px glomerocrysts 7% <6mm, Fsp 1% <4mm 7. Matrix: fine grained	x	x					GNS	
SO255-DR123-6	1. Rock Type: volcanic, basalt, fresh 2. Size: 33x24x25cm original size of block L, sample piece 16x14x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 30% <3mm 6. Phenocrysts: Px 5% <6mm; Ol 4% <5mm; Ol/Px glomerocrysts 2% <4mm, Fsp 1% <2mm 7. Matrix: fine grained 10. Comment: fresh	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR123-7	1. Rock Type: volcanic, basalt, fresh 2. Size: 13x8x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% <4mm 6. Phenocrysts: Ol/Px glomerocrysts 7% <5mm 7. Matrix: fine grained 9. Encrustations: 4mm glass 10. Comment: fresh				GL			GNS	
SO255-DR123-8	1. Rock Type: volcanic, basalt, fresh 2. Size: 12x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% <5mm 6. Phenocrysts: Px 5% <4mm; Ol 5% <3mm 7. Matrix: fine grained 10. Comment: fresh							GNS	
SO255-DR123-9	1. Rock Type: volcanic, basalt 2. Size: 20x19x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% <1mm 6. Phenocrysts: Px 5% <5mm; Ol 4% <3mm; Fsp 1% <2mm 7. Matrix: fine grained	x_air freight box	x					GNS	
SO255-DR123-10	1. Rock Type: volcanic, basalt, fresh 2. Size: 28x16x21cm original size of block W, sample piece 20x13x11cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% <1mm 6. Phenocrysts: Px 4% <4mm; Ol 3% <2mm; Fsp 1% <3mm 7. Matrix: fine grained	x_air freight box	x					GNS	

SO255-DR124

Description of Location and Structure: Volcanic Front, large cone ~7nm NE of Havre Volcano, southern slope upper 1/3 to summit

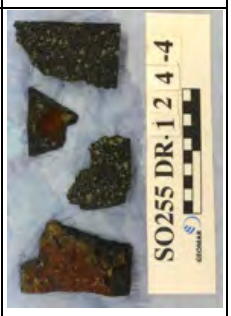
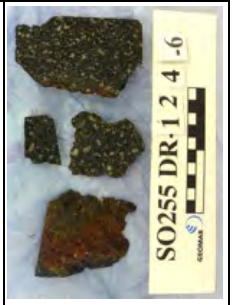
Dredge on bottom UTC 30/03/17 17:06hrs, lat 31 03.23'S, long 178 54,36'W, depth 1133m

Dredge off bottom UTC 30/03/17 18:16hrs, lat 31 02.85'S, long 178 54.33'W, depth 777m

total volume: full

Comments: abundant lava fragments and pillows, volcaniclastics and pumice. -1 to -11 highly Plg phyric fresh lava fragments, -12 & -13 significantly less phyric more dense lava.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR124-1	1. Rock Type: volcanic, basalt, altered surface, fresh inside 2. Size: 28x20x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 15% <1mm, open 6. Phenocrysts: Fsp 40% <1cm; Ol intergrowth in Fsp 1% <2mm; Px 1% <4mm 7. Matrix: fine grained 9. Encrustations: weathered surface, weathered glassy rim 10. Comment: -1 through -11 highly Fsp porphyritic basalts with lots of large Fsp phenocrysts	x_air freight box	x	2-3	GL			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR124-2	1. Rock Type: volcanic, basalt, altered surface, fresh inside 2. Size: 26x22x21cm original size of block D, sample piece 28x20x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 20% <2mm, open 6. Phenocrysts: Fsp 35% <8mm fresh; Ol <1% <2mm; Px very few <1% <3mm 7. Matrix: fine grained 9. Encrustations: weathered surface, weathered glass rim 10. Comment: intergrowth of Ol in Fsp and Px but also free in matrix	x	x		GL			GNS	
SO255-DR124-3	1. Rock Type: volcanic, basalt, altered surface, fresh inside 2. Size: 20x18x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 25% <5mm, open 6. Phenocrysts: Fsp 40% <8mm fresh; Ol 1% <2mm; Px <1% <2mm 7. Matrix: fine grained 9. Encrustations: weathered surface, weathered glassy rim 10. Comment: intergrowth of Ol in Fsp and Px; Ol and Px also free in matrix	x_air freight box	x		GL				
SO255-DR124-4	1. Rock Type: volcanic, basalt, altered surface, fresh inside 2. Size: 18x16x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 30% <3mm, open 6. Phenocrysts: Fsp 40% <1cm fresh; Ol 1% <1mm; Px 1% <2mm 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: thin glassy rim, weathered ~5mm 10. Comment: intergrowth of Ol in Fsp and independant in matrix	x	x	2-3	GL				
SO255-DR124-5	1. Rock Type: volcanic, basalt, altered surface, fresh inside 2. Size: 22x14x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: flow pattern, porphyric, matrix 40% bands from <1 to 2mm 6. Phenocrysts: Fsp 40% <5mm; Ol? <1% <1mm; Px ~1% <2mm 7. Matrix: fine grained 9. Encrustations: weathered surface	x	x	2-3	GL			Backup	
SO255-DR124-6	1. Rock Type: volcanic, basalt, altered surface, fresh inside 2. Size: 14x12x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, 40% phenocrysts, vesicles 50% <1mm 6. Phenocrysts: Fsp 40% 2-10mm fresh; Ol <1% <1mm only in Fsp; Px green ~1% <2mm 7. Matrix: fine grained 9. Encrustations: altered glass rim ~2mm	x	x	2-3	GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR124-7	1. Rock Type: volcanic, basalt, fresh 2. Size: 20x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 25% <1mm, 15% 1-5mm, small cracks 6. Phenocrysts: Fsp 40% <1cm; Ol intergrowth in Fsp 1% <2mm; Px 1% <4mm 7. Matrix: fine grained 8. Secondary Minerals: slightly altered crust			2-3				back up	
SO255-DR124-8	1. Rock Type: volcanic, basalt, fresh 2. Size: 17x16x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric 40%, matrix vesicles 50% 0.1-1mm 6. Phenocrysts: Fsp 40% 2-10mm; Px green 1% ~4mm 7. Matrix: fine grained 10. Comment: sponge on the side	x	x	2-3	GL			back up, GNS	
SO255-DR124-9	1. Rock Type: volcanic, basalt, relatively fresh, weathered outside 2. Size: 15x16x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 30% <3mm, open 6. Phenocrysts: Fsp 40% <1cm fresh; Px <1% <2mm; Ol <1% <1mm 7. Matrix: fine grained 9. Encrustations: weathered surface, glassy rim	x	x	2-3	GL				
SO255-DR124-10	1. Rock Type: volcanic, basalt, fresh, altered surface 2. Size: 15x11x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 20% <3mm, open 6. Phenocrysts: Fsp 30% <5mm; Ol <1% <1mm; Px 1% <4mm 7. Matrix: fine grained 9. Encrustations: no glassy rim 10. Comment: really fresh sample , Ol partly as inclusions in Fsp	x_air freight box	x						
SO255-DR124-11	1. Rock Type: volcanic, basalt, fresh, altered surface 2. Size: 22x16x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 40% <5mm, open 6. Phenocrysts: Fsp 40% <12mm; few Ol <1% <1mm; few Px 1% <2mm 7. Matrix: fine grained 9. Encrustations: thin glassy rim ~3mm 10. Comment: back up sample							back up	
SO255-DR124-12	1. Rock Type: volcanic, basaltic andesite, fresh 2. Size: 14x9x5cm 3. Shape / Angularity: subangular to angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric - apyric, weakly vesicular 5-10% ~2mm some up to 1cm 6. Phenocrysts: Px 5% <3mm black-brown and black green; few Fsp <1% <2mm 7. Matrix: fine grained, dense, lineation 10. Comment: two different Px, vesicles in vein??, different from prev. samples	x_air freight box	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR124-13	1. Rock Type: volcanic, dense andesite?, fairly fresh 2. Size: 9x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric 15% crystals, vesicles 3% 6. Phenocrysts: Fsp 15% 1-5mm 7. Matrix: fine grained		x	3					
SO255-DR124-14	1. Rock Type: pumice, black some light brown areas 2. Size: 11x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black when wet, partly light brown 5. Texture / Vesicularity: 15% 1-2mm, 10% clasts 10mm 7. Matrix: pumiceous 10. Comment: clasts ~1cm, perhaps mixing of two melts?								
SO255-DR124-15	1. Rock Type: pumice, fresh 2. Size: 10x9x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: white 5. Texture / Vesicularity: vesicles 15% 2-10mm 6. Phenocrysts: Px? needles <1% <1mm 7. Matrix: pumice 8. Secondary Minerals: slight alteration along rim								
SO255-DR124-16	1. Rock Type: volcanic, three basalt pieces, part of larger clasts 2. Size: 19x12x11cm, 18x13x11cm, 13x9x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: uncut 5. Texture / Vesicularity: porphyric, vesicles 50%, >10mm 10%, ~1mm 40% 6. Phenocrysts: Fsp 25% 2-10mm 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: strong alteration on surface 10. Comment: possibly 2-3 basalt pieces with strong surface alteration								no pic

SO255-DR125

Description of Location and Structure: Kermadec Ridge Central Part, unclear if this structure belongs to volcanic front? SW slope of large volcanic edifice cut by NE-SW fault. Track along across fault line in uppermost 1/4 of slope.

Dredge on bottom UTC 30/03/17 20:11hrs, lat 31 1.54'S, long 178 44,43'W, depth 883m

Dredge off bottom UTC 30/03/17 21:13hrs, lat 31 1.21'S, long 178 44.35'W, depth 504m

total volume: 1/3 full

Comments: lava fragments some embedded in carbonate matrix, volcaniclastics, sample -1 to -5 less phyric Px/Fsp andesites with dense matrix, -6 to -8 phyric group

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR125-1	1. Rock Type: volcanic, andesite, fresh, less phyric group 2. Size: 31x19x15cm original size of block Z 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, fairly dense vesicles <1% <2mm, mostly open some CC filled 6. Phenocrysts: Fsp / Pxy intergrowth 25% <4mm; single Fsp 5% <2mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles partly CC filled 10. Comment: fresh dense material ---> less phyric group	x_air freight box	x	2-3			TS box 64-		

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR125-2	1. Rock Type: volcanic, andesite, fresh, less phyric group 2. Size: 39x22x21cm original size of block U 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, fairly dense vesicles <1% <2mm, mostly open some CC filled 6. Phenocrysts: Fsp / Pxy intergrowth 30% <5mm; single Fsp 2% <2mm, single Px <1% <2mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles partly CC filled 10. Comment: fresh dense material ---> less phyric group	x_air freight box	x	2-3				GNS	
SO255-DR125-3	1. Rock Type: volcanic, andesite, fresh, less phyric group 2. Size: 28x23x14cm original size of block J 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, fairly dense vesicles <1% <2mm, mostly open some CC filled 6. Phenocrysts: Fsp / Px intergrowth 35% <5mm; single Fsp + Px <1% <2mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles partly CC filled 10. Comment: fresh dense material ---> less phyric group, partly fractured	x_air freight box	x	2-3					
SO255-DR125-4	1. Rock Type: volcanic, andesite, fresh, less phyric group 2. Size: 10x9x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, fairly dense vesicles <1% <2mm, mostly open some CC filled 6. Phenocrysts: Fsp / Pxy intergrowth 35% <5mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles partly CC filled 10. Comment: fresh dense material ---> less phyric group	x_air freight box	x	2-3					
SO255-DR125-5	1. Rock Type: volcanic, andesite, fresh, less phyric group 2. Size: 13x9x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, non vesicular 6. Phenocrysts: Px 20% <4mm, mafic grains in matrix 5% <0.5mm --> magnetic; Fsp 5% <2mm 7. Matrix: fine grained 10. Comment: fresh dense material ---> less phyric group, magnetic, magnetite in matrix	x_air freight box	x	2-3					
SO255-DR125-6	1. Rock Type: volcanic, basaltic andesite, fresh, phyric group 2. Size: 20x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, few vesicles <1% <1mm, mostly open, some appear to be weatherd Ol holes 6. Phenocrysts: Fsp / Px intergrowth 30% <5mm; Ol <1% <1mm weathered 7. Matrix: fine grained 10. Comment: fractures cutting across rock, phyric group.	x_air freight box	x	2-3			TS box 64-	GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR125-7	1. Rock Type: volcanic, basaltic andesite, fresh, phyric group 2. Size: 20x15x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, non veasicular, holes are weatherd Ol 6. Phenocrysts: Fsp / Px intergrowth 30% <5mm; Ol <1% <1mm weathered 7. Matrix: fine grained 10. Comment: some fractures veins in matrix, phyric group	x	x					GNS	
SO255-DR125-8	1. Rock Type: volcanic, basaltic andesite, fresh, phyric group 2. Size: 14x13x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, few vesicles <1% <2mm, maybe weatherd Ol holes 6. Phenocrysts: Fsp / Px intergrowth 35% <5mm; Ol <1% ~1mm, few Px <1% <3mm 10. Comment: unfilled fractures, phyric group							back up	
SO255-DR125-9	1. Rock Type: volcanic, basalt, partly filled vesicles, mild alteration 2. Size: 36x25x20cm original size of block N 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, clasts <1%, vesicles <1-10mm, 30% 6. Phenocrysts: Fsp 20% 1-2mm; Px in Fsp 30% of Fsp 7. Matrix: aphyric 8. Secondary Minerals: vesicular fillings, mild alteration	x	x				TS box 64-	GNS	
SO255-DR125-10	1. Rock Type: volcaniclastic, large dark volcanic clasts in low clast content light matrix 2. Size: 21x13x12cm original size of block N 3. Shape / Angularity: subangular 4. Color of cut surface: dark matrix --> black light matrix, very light brown, multicolored clasts incl. grey, red, brown 5. Texture / Vesicularity: both matrices vesicles <1% <1mm, clasts up to 2cm 7. Matrix: aphyric, thin layer of dark matrix around clasts in dark matrix 8. Secondary Minerals: sediment light matrix or carbonate fillings near rim of black matrix 10. Comment: just cut once. Light matrix includes a few shell fragments							GNS	
SO255-DR125-11	1. Rock Type: sediment, volcanic, biogenic carbonate in matrix 2. Size: 14x12x11cm 3. Shape / Angularity: angular 4. Color of cut surface: mostly dark brown, black clasts in pale brown matrix with greeb coloring at veins and rim 5. Texture / Vesicularity: non-vesicular, hollow shells, sediment, muddy matrix with large clasts and shells up to 2cm 7. Matrix: carbonate mud 80% and fine grained volcanic clasts 10% and biogenous fragments 10% 8. Secondary Minerals: green coloring of matrix near rim and veins 10. Comment: volcaniclasts heavily altered, only cut in the middle								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR125-12	1. Rock Type: volcanic, basaltic andesite clast, strongly altered along rim, embedded in thin volcaniclastic matrix 2. Size: 17x15x10cm 3. Shape / Angularity: rounded 4. Color of cut surface: clast grey, brown when altered; matrix pale brown 5. Texture / Vesicularity: clast porphyric, phenocrysts 40% 1-5mm, vesicles in matrix 30% 1-4mm 6. Phenocrysts: Fsp 30%, Fsp/Px intergrowth 1-5mm, free Px 10% 1-3mm 7. Matrix: aphyric 8. Secondary Minerals: strong alteration rim, partly filled vesicles, cc mud in vesicles 9. Encrustations: thon Mn coating 10. Comment: just cut once								
SO255-DR125-13	1. Rock Type: volcaniclastic, weathered volcanic clasts + phenocrysts in brecciated groundmass 2. Size: 36x24x17cm original size of block B 3. Shape / Angularity: subangular 4. Color of cut surface: brown to grey 5. Texture / Vesicularity: brecciated, volcanic clasts are vesicular 6. Phenocrysts: Ol and Px crystals 2-3mm in brecciated groundmass, Px and Fsp in volcanic clasts 7. Matrix: brecciated weathered 8. Secondary Minerals: carbonate cementation in rim part							GNS	

SO255-DR126

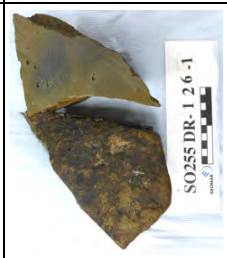
Description of Location and Structure: Kermadec Ridge Central Part, 18 nm SSE of L'Esperance Rock. NNE striking fault scarps cutting into WNW dipping flank of Kermadec Ridge, track from bottom to top auf fault step

Dredge on bottom UTC 31/03/17 02:51hrs, lat 31 36.76'S, long 178 51,93'W, depth 1217m

Dredge off bottom UTC 31/03/17 03:59hrs, lat 31 36.84'S, long 178 51.56'W, depth 872m

total volume: full

Comments: 50% lava fragments, one single very large columnar lava wich became block J and contains fresh grey core; 50% large pumice clasts. -1 to -5 aphyric, yellowish altered lava with minor Fsp and Px. Grey groundmass preserved in -1.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR126-1	1. Rock Type: volcanic, lava, realtively dense, from large piece of columnar basalt. block J 2. Size: 54x39x28cm original size of block J 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: fairly aphyric, dense rare vesicles <3% up to 6mm 6. Phenocrysts: Fsp 3-5% <4mm; Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 3mm Mn crust 10. Comment: cooling texture, fractures oriented in the same directions	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR126-2	1. Rock Type: volcanic, lava, realtively dense 2. Size: 21x21x12cm original size of block Q 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: fairly aphyric, dense rare vesicles <2% up to 5cm 6. Phenocrysts: Fsp 2% <1mm; Px 1% <2mm 7. Matrix: fine grained 10. Comment: similar to -1, Fsp slightly altered	x_air freight box	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR126-3	1. Rock Type: volcanic, lava, realtively dense 2. Size: 30x23x15cm original size of block L, sample piece 28x16x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: fairly aphyric, dense rare vesicles <5% up to 5mm 6. Phenocrysts: Fsp 2% <1mm; Px 3% <2mm 7. Matrix: fine grained: 10. Comment: Fsp slightly altered similar to -1 and -2	x_air freight box	x					GNS	
SO255-DR126-4	1. Rock Type: volcanic, lava, realtively dense 2. Size: 27x21x17cm original size of block M, sampled piece 21x21x12cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: fairly aphyric, dense rare vesicles <5% up to 8mn 6. Phenocrysts: Fsp 1%; Px 5% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: similar to prev. samples	x_air freight box	x				TS box 64-	GNS	
SO255-DR126-5	1. Rock Type: volcanic, lava, altered 2. Size: 22x19x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark beige 5. Texture / Vesicularity: fairly aphyric, dense rare vesicles <1% <4mm 6. Phenocrysts: Fsp 1% <2mm 7. Matrix: fine grained 8. Secondary Minerals: CC veins 9. Encrustations: 2mm Mn crust 10. Comment: dendritic Mn oxide								
SO255-DR126-6	1. Rock Type: volcaniclastic, oxidized 2. Size: 18x19x7cm original size of block J 3. Shape / Angularity: subangular 4. Color of cut surface: red brown matrix 5. Texture / Vesicularity: polymict 7. Matrix: 75% matrix, medium grained 10. Comment: 0.8x0.5cm biggest clast							GNS	
SO255-DR126-7	1. Rock Type: volcaniclastic 2. Size: 26x22x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: red clasts, white - yellow matrix 5. Texture / Vesicularity: polymict 7. Matrix: fine grained 10. Comment: lava clast, <5cm largest clast, one grey clast less weathered not oxidized							GNS	
SO255-DR126-8	1. Rock Type: volcaniclastic, oxidized 2. Size: 23x17x8cm original size of block T 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: monomictic 7. Matrix: light brown, mud, fine grained 9. Encrustations: 2mm Mn crust 10. Comment: largest clast 5cm, weathered lava clasts							GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR126-9	1. Rock Type: volcaniclastic 2. Size: 21x20x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light brown 5. Texture / Vesicularity: volcaniclastic, massive 6. Phenocrysts: clasts, contain minerals 7. Matrix: fine medium grained 8. Secondary Minerals: 1mm Mn crust 10. Comment: biggest clast 2cm contains minerals Px, Plg								
SO255-DR126-10	1. Rock Type: pumice, porphyric 2. Size: 15x11x8cm, 15x11x10 3. Shape / Angularity: subrounded 4. Color of cut surface: white grey 5. Texture / Vesicularity: vesicles <15% 1.5x1cm 6. Phenocrysts: Amph 3% <4mm; Plg? 7. Matrix: fine grained 10. Comment: altered on some sides								
SO255-DR126-11	1. Rock Type: pumice, porphyric 2. Size: 24x12x8cm, 20x14x15cm 3. Shape / Angularity: subrounded / subangular 4. Color of cut surface: white grey 5. Texture / Vesicularity: vesicles <20% 0.5x0.5cm 6. Phenocrysts: Amph 3% <2mm; Plg? 7. Matrix: fine grained 10. Comment: pink and yellowish oxidation								
SO255-DR126-12	1. Rock Type: pumice, porphyric 2. Size: 15x15x10cm, 12x14x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: white grey 5. Texture / Vesicularity: vesicles <10% 0.5cm 6. Phenocrysts: Amph 5% <4mm; Plg5% <2mm 7. Matrix: fine grained 10. Comment: yellow - brown alteration outside							GNS	
SO255-DR126-13	1. Rock Type: pumice, dacitic 2. Size: 14x8x6cm 3. Shape / Angularity: rounded 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyric, vesicles <30% max 1cm 6. Phenocrysts: Plg; Px <2mm 7. Matrix: fine grained medium 10. Comment: porphyritic								

SO255-DR127

Description of Location and Structure: Kermadec Ridge Central Part, 6nm S of DR126, steep W facing fault scarp, bottom to top

Dredge on bottom UTC 31/03/17 05:53hrs, lat 31 41.92'S, long 178 55,55'W, depth 1300m
Dredge off bottom UTC 31/03/17 08:00hrs, lat 31 42.02'S, long 178 55.37'W, depth 910m
total volume: full
Comments: volcaniclastic rocks

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR127-1	1. Rock Type: volcaniclastic 2. Size: 70x47x26cm original size of block O, sample piece 24x12x17cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish to beige; some black clasts, basaltic 5. Texture / Vesicularity: dense flow structure; layering; brownish clasts up to 2cm; basaltic clasts up to 1cm 6. Phenocrysts: Fsp in basaltic clasts 7. Matrix: fine grained 9. Encrustations: 3mm Mn crust 10. Comment: 6cm layer of coarse grained matrix with basaltic clasts (see point 6), fairly fresh, 1cm layer of flow structure, 7cm of volcaniclastic, altered (see point 5), 4cm layer of fine grained material							GNS	
SO255-DR127-2	1. Rock Type: volcaniclastic, altered 2. Size: 54x38x22cm original size of block G, sample piece 19x8x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: white matrix; clasts yellowish greenish grey black up to 1.5cm 5. Texture / Vesicularity: dense flow structure; layering; brownish clasts up to 2cm; basaltic clasts up to 1cm 7. Matrix: dense 9. Encrustations: 3mm Mn crust 10. Comment: pebbles / clasts are mostly pumice							GNS	
SO255-DR127-3	1. Rock Type: volcaniclastic 2. Size: 64x54x22cm original size of block R, sample piece 28x12x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish black grey 5. Texture / Vesicularity: layered coarse grained 7. Matrix: medium grained 9. Encrustations: 3mm Mn crust 10. Comment: 1cm layer of very small pebbles. 0.5cm fine grained layer, 4cm of small pebbles, 2cm of very small pebbles							GNS	
SO255-DR127-4	1. Rock Type: volcaniclastic, highly altered 2. Size: 17x12x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface:reddish brownish black 5. Texture / Vesicularity: small to very small pebbles up to 0.5cm 7. Matrix: medium grained 10. Comment: alteration rim							GNS	
SO255-DR127-5	1. Rock Type: volcaniclastic 2. Size: 17x12x8cm 3. Shape / Angularity: subangular to subrounded 4. Color of cut surface: grey to brownish black 5. Texture / Vesicularity: layered 7. Matrix: fine grained 10. Comment: 4cm layer of coarse grained sediment, 1.5cm of volcaniclastic; matrix medium grained; pebbles up to 1.5cm black, 2.5cm of sediment with flow structure and very fine grained							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR127-6	1. Rock Type: volcaniclastic 2. Size: 39x19x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish to black 5. Texture / Vesicularity: layered 7. Matrix: fine grained 9. Encrustations: 3mm Mn crust 10. Comment: 2.5cm of coarse grained material, 1.5cm with fine matrix with pebbles up to 0.5cm, 1.5cm coarse grained, 4.5cm of fine matrix with pebbles up to 0.5cm and one Fsp phyric basaltic clasts ø 2.5cm							GNS	
SO255-DR127-7	1. Rock Type: sediment 2. Size: 12x12x7cm 3. Shape / Angularity: subrounded to subangular 4. Color of cut surface: brownish 5. Texture / Vesicularity: layered 6. Phenocrysts: Fsp in basaltic clasts 10. Comment: 1.5cm very fine grained, 1.5cm medium grained, 0.5cm very fine grained, 2cm medium grained, 1.5cm very fine grained							GNS	
SO255-DR127-8	1. Rock Type: volcaniclastic 2. Size: 48x38x23cm original size of block O, sample piece 20x15x11cm 3. Shape / Angularity: angular 4. Color of cut surface: black reddish brownish 5. Texture / Vesicularity: coarse grained, no vesicles, basaltiv clasts up to 1.5cm with Fsp							GNS	

SO255-DR128

Description of Location and Structure: Kermadec Ridge Central Part, tectonized seamount on W flank of Kermadec, lower slope at northern end of feature. May have formed when slope of Western Kermadec Ridge formed.

Dredge on bottom UTC 31/03/17 10:24hrs, lat 31 46.94'S, long 179 2,11'W, depth 2314m

Dredge off bottom UTC 31/03/17 11:33hrs, lat 31 47.05'S, long 179 1.74'W, depth 1933m

total volume: few rocks

Comments: fresh Ol-Px lava fragments, phenocrysts are fairly large in some samples, resembles somewhat ankaramites of DR28

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR128-1	1. Rock Type: basalt, fresh minerals 2. Size: 14x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 3% vesicles <1cm, porphyric 6. Phenocrysts: Ol 5% <7mm; Px 5% <5mm; Fsp 1% <3mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x_air freight box	x				TS-Box 1-63	GNS	
SO255-DR128-2	1. Rock Type: basalt, fresh minerals 2. Size: 15x8x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 4% vesicles <9mm, porphyric 6. Phenocrysts: Ol 5% <6mm; Px 3% <3mm; Fsp 1% <2mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x_air freight box	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR128-3	1. Rock Type: basalt 2. Size: 13x10x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: black, bluish 5. Texture / Vesicularity: 7% vesicles <2mm, porphyric 6. Phenocrysts: Px 35% <1cm; Ol 5% <8mm 7. Matrix: fine grained 9. Encrustations: 3.5cm scoria attached 10. Comment: huge Cr diopside	x						GNS	
SO255-DR128-4	1. Rock Type: basalt 2. Size: 12x12x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 15% vesicles <2mm, slightly phyric 6. Phenocrysts: Px <1% <5mm <1mm; Ol <1% <1mm 7. Matrix: fine grained 9. Encrustations: chilled margin	x						GNS	
SO255-DR128-5	1. Rock Type: volcanic, basalt, fresh 2. Size: 11x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey - black 5. Texture / Vesicularity: 7% vesicles <3mm, slightly 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: similar to -6 and -7	x_air freight box	x				TS-Box 1-63	GNS	
SO255-DR128-6	1. Rock Type: volcanic, basalt, fresh 2. Size: 8x6x6cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: 10% vesicles <2mm, slightly 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: similar to -5 and -7	x_air freight box							
SO255-DR128-7	1. Rock Type: volcanic, basalt, fresh 2. Size: 9x7x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: 7% vesicles <8mm, slightly 6. Phenocrysts: Px 1% <1mm; Ol 1% <1mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: similar to -5 and -6	x							

SO255-DR129

Description of Location and Structure: Kermadec Ridge Central Part, W flank of tectonized cone, 1nm from DR128 upslope. The cone appears to have formed when Kermadec Ridge formed = Vitiaz Arc split

Dredge on bottom UTC 31/03/17 13:14hrs, lat 31 48.24'S, long 179 2,35'W, depth 1716m

Dredge off bottom UTC 31/03/17 14:25hrs, lat 31 48.28'S, long 179 1.99'W, depth 1325m

total volume: full

Comments: heterolithological lava fragments, dominant facies (-1 to -11) ultraphyric Cr-Diopside-Ol lava, second facies is less phyric with smaller Ol, Px and minor Fsp (sample -12 to -17), -18 has an area with abundant Ol next to Ol free area indicating heteregeneous phenocryst distribution within a single lava flow unit, -19 to -24 are less phyric to aphyric lava samples, -26 is a very Ol rich sample with less Px.

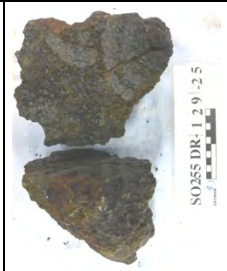
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR129-1	1. Rock Type: volcanic, basaltic, hyper porphyric with large Cr-diopside Ol phenocrysts 2. Size: 20x13x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: highly porphyritic, vesicles 5% up to 1.5cm 6. Phenocrysts: Px greenish Cr diopside 40% <1.5cm; Ol 25% <1.5cm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: fresh Ol and Px, sample with the highest amount of minerals	x_air freight box	x				TS-Box 1-63	GNS; JAMSTEC	
SO255-DR129-2	1. Rock Type: volcanic, basaltic, porphyric with large Cr-diopside Ol phenocrysts 2. Size: 20x17x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyritic, vesicles 10% up to 2cm 6. Phenocrysts: Px dark light greenish Cr diopside 30% <1cm; Ol yellowish 15-20% up to 1cm; Plg ~1% up to 2mm 7. Matrix: fine grained 10. Comment: fresh Ol and fresh Px; two generations of Px; similar to -1	x_air freight box	x					GNS; JAMSTEC	
SO255-DR129-3	1. Rock Type: volcanic, basaltic, with large Cr-diopside Ol phenocrysts 2. Size: 20x17x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: highly porphyritic, vesicles 10% <1mm some large up to 1cm 6. Phenocrysts: Ol lightgreen 20% <1.5cm; Px greenish Cr diopside 15% <1.5cm 7. Matrix: fine grained 10. Comment: fresh Ol and Px ---> similar to -1	x_air freight box	x					GNS; JAMSTEC	
SO255-DR129-4	1. Rock Type: volcanic, basaltic, porphyric with large Cr-diopside Ol phenocrysts 2. Size: 18x17x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10% <5mm, pipe like 6. Phenocrysts: Px green 20% <8mm; Ol lightgreen 15% <6mm 7. Matrix: fine grained 10. Comment: fresh Ol and Px	x	x					GNS; JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR129-5	1. Rock Type: volcanic, basaltic, hyper porphyric with large Cr-diopside Ol phenocrysts 2. Size: 12x9x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: highly porphyritic, vesicles 15% <8mm pipe like 6. Phenocrysts: Px greenish Cr diopside 20% <1.5cm; Ol 15% <1cm, light green 7. Matrix: fine grained 10. Comment: TS of large Px 1.5cm	x						JAMSTEC	
SO255-DR129-6	1. Rock Type: volcanic, basaltic, porphyric with large Cr-diopside Ol phenocrysts 2. Size: 16x14x13cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: highly porphyritic, vesicles 10% mostly 4-8mm, many <1mm rounded 6. Phenocrysts: Px greenish Cr diopside 15% 3-9mm; Ol 10% 1-5mm light green; Fsp 3% 1-2mm white 7. Matrix: fine grained 10. Comment: fresh Px, Ol, Fsp	x	x					JAMSTEC	
SO255-DR129-7	1. Rock Type: volcanic, basaltic 2. Size: 14x13x10cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: highly porphyritic, vesicles 15% 2mm-1.5cm pipe like 6. Phenocrysts: Px greenish Cr diopside 25% 2-7mm; Ol 15% 1-6mm light green 7. Matrix: fine grained 10. Comment: fresh Px and Ol							GNS; JAMSTEC	
SO255-DR129-8	1. Rock Type: volcanic, basaltic 2. Size: 20x10x7cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10% <1-2mm, rounded 6. Phenocrysts: Px greenish Cr diopside 15% 3-5mm; Ol 15% 2-7mm light green 7. Matrix: fine grained 10. Comment: fresh Px and Ol							GNS; JAMSTEC	
SO255-DR129-9	1. Rock Type: volcanic, basaltic 2. Size: 20x17x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: highly porphyritic 40% phenocrysts, vesicles 40%, 2-6mm 10% 6. Phenocrysts: Px greenish Cr diopside 20% 1-10mm; Ol 15% 1-8mm fresh; Fsp 5% 1-3mm white 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: no further preparation							GNS; JAMSTEC	
SO255-DR129-10	1. Rock Type: volcanic, basaltic 2. Size: 13x13x13cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 30% in layers 6. Phenocrysts: Px greenish Cr diopside 20% 1-5cm; Ol 20% 1-14mm partly altered 7. Matrix: fine grained 9. Encrustations: some vesicles filled with soft sediment, fresh glass? 10. Comment: Ol partially altered, check quality of glass				GI			JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR129-11	1. Rock Type: volcanic, basaltic 2. Size: 18x16x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 50%; 1-5mm 20%; 30%<1mm 6. Phenocrysts: Ol 15% 1-3mm; Px black and green 20% 1-3mm 7. Matrix: fine grained 8. Secondary Minerals: vesicular fillings							JAMSTEC	
SO255-DR129-12	1. Rock Type: volcanic, basaltic 2. Size: 18x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 50%; 1-3mm 10%; 40% <1mm 6. Phenocrysts: Ol 5% 1-3mm; Px 5% 1-5mm both fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating	x_air freight box	x				TS-Box 1-63	GNS; JAMSTEC	
SO255-DR129-13	1. Rock Type: volcanic, basaltic 2. Size: 20x18x12cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, slightly vesicular 10%; 1mm-1cm, rounded or pipe like, some vesicles filled 6. Phenocrysts: Px 15% 1-6mm green; Ol 5-10% 2-4mm light green; Fsp 3% 1-2mm white 7. Matrix: fine grained 10. Comment: fresh Px, Ol	x	x					GNS; JAMSTEC	
SO255-DR129-14	1. Rock Type: volcanic, basaltic 2. Size: 13x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, slightly vesicular 10%; <1 up to 3mm, rounded, open 6. Phenocrysts: Px 7% <1 up to 2.5mm green; Ol 3% <1mm light green; Fsp 10% <1 up to 2mm white 7. Matrix: fine grained 10. Comment: fresh Px, Ol, Fsp	x_air freight box	x					GNS; JAMSTEC	
SO255-DR129-15	1. Rock Type: volcanic, basaltic 2. Size: 18x14x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, moderate vesicular 20% <1mm up to 4mm, rounded unfilled 6. Phenocrysts: Px 7% <1mm up to 2.5mm bluish green; Ol 3% <1mm brownish green 7. Matrix: fine grained 10. Comment: fresh Px, Ol but the rock has fewer phenocryts than most samples before	x	x					GNS; JAMSTEC	
SO255-DR129-16	1. Rock Type: volcanic, basaltic 2. Size: 13x11x11cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, moderate vesicular 20%; some 1-4mm most <1mm slightly filled 6. Phenocrysts: Px 5% 1-2mm greenish white; Ol 5% 1-3mm brownish green; Fsp 3% 1-2mm white 7. Matrix: fine grained 10. Comment: fresh Px, Ol, Fsp							JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR129-17	1. Rock Type: volcanic, fresh 2. Size: 20x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 50%; 2-5mm 5%; <1mm 45% 6. Phenocrysts: Px 10% 1-2mm 7. Matrix: fine grained 9. Encrustations: thin Mn coating	x_air freight box	x					GNS; JAMSTEC	
SO255-DR129-18	1. Rock Type: volcanic, fresh, has an Ol phyric and near Ol free, looks like mixing of lava / melt, needs care to separate both parts to avoid artificial mixing when preparing bulk rock for analysis 2. Size: 20x12x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric 25% phenocysts, vesicles 40%; 1-2mm 5%; 35% <1mm 6. Phenocrysts: Ol 0% in phenocryst free part; 10% fresh Ol in phenocryst rich part 1-3mm; Px 1% vs 10% in the two zones 7. Matrix: fine grained 8. Secondary Minerals: minor sediment / CC filling of vesicles 9. Encrustations: thin Mn coating 10. Comment: magma / lava mixing resultng in variable Ol and Px content. Attention GC slab contains both zones and needs to be cut again before preparing bulk rock material for analysis	x	x					GNS; JAMSTEC	
SO255-DR129-19	1. Rock Type: volcanic, fresh, filled vesicles 2. Size: 20x11x9cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: aphyric, varying vesicularity, layered 40%; 2-4mm 10%; 30% <1mm 6. Phenocrysts: Ol 5% 1-3mm; Px 5% 1-5mm both fresh 7. Matrix: fine grained with flow pattern 8. Secondary Minerals: vesicle fillings, CC? 10. Comment: flow pattern with varying vesicle size and percentage	x	x					GNS; JAMSTEC	
SO255-DR129-20	1. Rock Type: volcanic, basaltic 2. Size: 18x12x12cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: near aphyric, vesicles 10% <1mm up to 2mm rounded, some vesicles filled with sediment 6. Phenocrysts: Px 3% <1 up to 3mm green; Ol 1% <1mm brownish green 7. Matrix: fine grained 10. Comment: nearly aphyric rock, phenocrysts are fresh	x	x					GNS; JAMSTEC	
SO255-DR129-21	1. Rock Type: volcanic, basaltic 2. Size: 18x16x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: less phyric, vesicles 35%; 1-3mm rounded partly filled with fine grained sediment 6. Phenocrysts: Px 7% <1 up to 3mm green; Ol 1-3% <1mm greenih brown 7. Matrix: fine grained 10. Comment: fresh Px & Ol, highly vesicular	x	x					GNS; JAMSTEC	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR129-22	1. Rock Type: volcanic, basaltic 2. Size: 19x15x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 30%; <1 up to 2cm elongated or rounded some vesicles filled with sediment 6. Phenocrysts: Px 10% 1-3mm green; Ol 5% <1mm up to 1.5mm; brownish green; Fsp 3% <1mm up to 1mm white 7. Matrix: fine grained 10. Comment: fresh Px, Ol, Fsp, highly versicular but more phenocrysts than -21	x	x					JAMSTEC	
SO255-DR129-23	1. Rock Type: volcanic, basaltic 2. Size: 12x12x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles40% <1mm up to 5mm rounded, some vesicles filled with sediment 6. Phenocrysts: Px 7% <1 up to 2mm green; Ol 3% <1mm brownish greeen 7. Matrix: fine grained 10. Comment: fresh Px + Ol, highly vesicular sample	x	x					JAMSTEC	
SO255-DR129-24	1. Rock Type: volcanic, basaltic 2. Size: 18x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 50%; 1-3mm 10%; 40% <1mm 6. Phenocrysts: Ol 5% 1-3mm; Px 5% 1-5mm both fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating							JAMSTEC	
SO255-DR129-25	1. Rock Type: volcanic, weathered groundmass but with fresh phenocrysts 2. Size: 25x16x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: black brown 5. Texture / Vesicularity: prophyric 40% phenocrysts; 10-30% vesicles 1-4mm ø, large cracks 6. Phenocrysts: Px 20% 1-7mm fresh; Ol 20% 1-3mm; both fresh 7. Matrix: fine grained and weathered 9. Encrustations: thin Mn coating 10. Comment: matrix well weathered, some fresh parts, phenocrysts mostly fresh							JAMSTEC	
SO255-DR129-26	1. Rock Type: volcanic, basaltic 2. Size: 25x11x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 30%; 2-4mm 5%; 25% <1mm 6. Phenocrysts: Ol 25% 1-4mm fresh; Px 10% 1-3mm fresh green 7. Matrix: fine grained 8. Secondary Minerals: few vesicle fillings, sediment grey 9. Encrustations: thin Mn coating 10. Comment: rich in Ol	x	x					GNS, JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR129-27	1. Rock Type: volcanic, mild alteration 2. Size: 13x12x10cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: varying vesicle percentages and sizes, 30% overall, <1mm 20%; >1mm 10% 6. Phenocrysts: Px 10% 1-2mm; Ol 3% 1mm mildly altered 7. Matrix: fine grained 8. Secondary Minerals: some sediment filling of vesicles 10. Comment: red brown alteration spots 1% Fe-oxide, slightly magnetic							JAMSTEC	
SO255-DR129-28	1. Rock Type: volcanic, basaltic, fresh 2. Size: 25x10x9cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 40%; 1-3mm 10%; 30% <1mm 6. Phenocrysts: Ol 35% 1-7mm; Px 10% 1-4mm, green fresh 7. Matrix: fine grained 8. Secondary Minerals: some sediment filled vesicles, grey 9. Encrustations: thin Mn coating 10. Comment: very rich in fresh Ol							JAMSTEC	

SO255-DR130

Description of Location and Structure: Kermadec Ridge Central Part, small Seamount 7nm north of tectonized large cone at margin to basin in the West. Track along western slope.

Dredge on bottom UTC 31/03/17 17:00hrs, lat 31 40.97'S, long 179 0,90'W, depth 2395m
Dredge off bottom UTC 31/03/17 18:01hrs, lat 31 41,28'S, long 179 0,55'W, depth 2091m
total volume: few rocks
Comments: fresh to slightly altered Plg phyric lava with minor Ol

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR130-1	1. Rock Type: volcanic, fresh 2. Size: 21x14x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20-30% up to 1cm mostly open 6. Phenocrysts: Plg 15% up to 5mm fresh; Ol 1% up to 1mm, color of minerals appears a bit brownish 7. Matrix: fine grained 8. Secondary Minerals: some vesicles are filled with sediment 9. Encrustations: 1mm Mn crust 10. Comment: samples -1 to -4 are very similar and appear fresher than samples -5 & -6, glass slab separated and GC is in air-freight box	x_air freight box	x	2	GL		GC in air-freight box	GNS	
SO255-DR130-2	1. Rock Type: volcanic, fresh 2. Size: 16x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 15% up to 2cm, open 6. Phenocrysts: Plg 10% up to 5mm fresh; Ol 1% up to 1mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: smaller glass margin than -1	x_air freight box	x	2	GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR130-3	1. Rock Type: volcanic, fresh 2. Size: 22x22x14cm original size of block R 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20% up to 1cm, open 6. Phenocrysts: Plg 10-15% up to 5mm fresh; Ol <1% <1mm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: several pieces of block R	x_air freight box	x	2	GL			GNS	
SO255-DR130-4	1. Rock Type: volcanic, relatively fresh 2. Size: 9x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 15% up to 1cm mostly open 6. Phenocrysts: Plg 10% up to 3mm rel. fresh; Ol 1% up to 2mm 7. Matrix: fine grained 8. Secondary Minerals: some vesicles are filled with mud 9. Encrustations: 1mm Mn crust 10. Comment: smaller vesicles and Fsp than other samples and overall appears more altered than prev. samples but is fresher than -5 & -6			3	GL				
SO255-DR130-5	1. Rock Type: volcanic, slightly altered 2. Size: 19x18x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10-15% up to 2cm mostly open 6. Phenocrysts: Plg 10% up to 6mm slightly altered; Ol 5% <1mm to 2mm, slightly altered 7. Matrix: fine grained 8. Secondary Minerals: some vesicles are filled with mud 9. Encrustations: 1mm Mn coating 10. Comment: different to -1 to -4 by having slightly more Ol	x_air freight box	x	3-4			GC in air-freight box	GNS	
SO255-DR130-6	1. Rock Type: volcanic, slightly altered 2. Size: 12x10x8cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10% 1-7mm mostly unfilled 6. Phenocrysts: Plg 10% 1-4mm slightly altered; Ol 3-5% <1mm, slightly altered 7. Matrix: fine grained 8. Secondary Minerals: few vesicles filled with secondary material 9. Encrustations: thin Mn coating 10. Comment: rock is similar to -5	x_air freight box	x	3-4					

SO255-DR131

Description of Location and Structure: Kermadec Ridge 3nm SSW of tectonized seamount on slope (128+129); WNW facing slope, first morphological step above basin

Dredge on bottom UTC 31/03/17 21:02hrs, lat 31 51.82'S, long 179 3,69'W, depth 2040m

Dredge off bottom UTC 31/03/17 22:02hrs, lat 31 51,82'S, long 179 3,38'W, depth 1730m

total volume: 1/4 full

Comments: fairly fresh to slightly altered Fsp-Ol-Px phyric lava fragments

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR131-1	1. Rock Type: volcanic, basalt, fresh 2. Size: 20x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 20% mostly <1mm, some 4mm ø, open 6. Phenocrysts: Fsp 15% <3mm; Px 1% <2mm; Ol 1% <2mm fresh 7. Matrix: fine grained 10. Comment: flow texture in some parts of the rock, 1-2cm thick mini flow more vesicular, less phyric compared to surrounding matrix ---> magma mixing? different compositions?. Sample representative for most samples of the dredge	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR131-2	1. Rock Type: volcanic, basalt, fresh 2. Size: 16x11x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, strongly vesicular 30% <1mm some up to 5mm ø, open 6. Phenocrysts: Fsp 10% <5mm; Px 2% <2mm; Ol 2% <4mm fresh 7. Matrix: fine grained 10. Comment: flow texture, magma mixing? ---> similar to 1	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR131-3	1. Rock Type: volcanic, fresh 2. Size: 16x11x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10% mostly <1mm, vesicles only within larger rounded parts of the rock, in plasces filled with sediment 6. Phenocrysts: Fsp 5% <3mm; Px 3% <1mm; Ol 5% 1-2mm 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: thin Mn coating 10. Comment: vesicles have bubble like structure	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR131-4	1. Rock Type: volcanic, fresh 2. Size: 19x11x9cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, few vesicles 5% <1mm open 6. Phenocrysts: Px 7% <1mm to 4mm; Ol 3% <1mm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: different from -1 to -3 by being denser and lack of Fsp	x	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR131-5	1. Rock Type: volcanic, fresh 2. Size: 22x15x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 15-20% <1mm to 3mm, some filled with sediment 6. Phenocrysts: Fsp 7% <1mm to 2mm; Px 3% 1-2mm; Ol 5% 1-3mm fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: backup sample							back uop	
SO255-DR131-6	1. Rock Type: volcanic, fresh 2. Size: 18x14x13cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10% <1mm open 6. Phenocrysts: Fsp 7% <1mm to 3mm to 2mm; Px 3% <1mm; Ol 7% <1mm some 1-3mm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: very many small <0.5mm Ol phenocrysts	x	x					GNS	
SO255-DR131-7	1. Rock Type: volcanic, slightly fresh 2. Size: 17x12x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10% <1mm to 3mm, some filled with sediment 6. Phenocrysts: Fsp 7% 1-2mm; Px 2% <1 to 1.5mm; Ol 5% 1-4mm altered 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: Ol very altered								
SO255-DR131-8	1. Rock Type: volcanic, slightly fresh 2. Size: 21x18x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 5% <1mm to 3mm, some filled with sediment 6. Phenocrysts: Fsp 5% <1mm; Px 7% 1-3mm; Ol 5% 1-4mm altered 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: back up							back up	
SO255-DR131-9	1. Rock Type: sediment 2. Size: 20x12x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: greyish white 5. Texture / Vesicularity: few clasts within fine grained CC matrix 7. Matrix: fine grained 9. Encrustations: thin Mn coating							GNS	

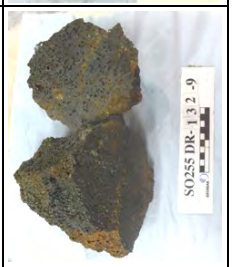
SO255-DR132

Description of Location and Structure: Kermadec Ridge, central section; 3nm SSW of large tectonized seamount. Track along step in W-facing slope of K.R., from bottom to near top.

Dredge on bottom UTC 01/04/17 00:38hrs, lat 31 58.73'S, long 179 6,44'W, depth 1910m
Dredge off bottom UTC 31/03/17 01:43hrs, lat 31 51,63'S, long 179 6,12'W, depth 1635m
total volume: 1/3 full
Comments: lava fragments + sediments. -1 through -10 Fsp >> Px phyric lava, slightly to moderately altered, -2, -4 and -5 with fresh glass cut off.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR132-1	1. Rock Type: volcanic, fresh inside 2. Size: 20x19x18cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 45%, <1mm 25%, 2-6mm 20% 6. Phenocrysts: Fsp 15-20% 2-6mm fresh; Px 1% 1-2mm fresh often next to Fsp; Ol <1% ~1mm 7. Matrix: fine grained 8. Secondary Minerals: alterataion of vesicles and veins and vesicle fillings, strong surface alteration	x_air freight box	x	2-3			GC in air-freight box	GNS	
SO255-DR132-2	1. Rock Type: volcanic, fresh 2. Size: 13x11x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 50%, ø increasing from one side to the other, 1-3mm 6. Phenocrysts: Fsp 15-20% 1-7mm fresh; Px 3% 1-5mm fresh often next to Fsp; Ol <1% ~1mm fresh often next to Fsp 7. Matrix: fine grained 8. Secondary Minerals: minor surface alteration	x_air freight box	x	2-3	GL				
SO255-DR132-3	1. Rock Type: volcanic, fresh 2. Size: 11x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, varying vesicularity 20-50% 1-2mm 6. Phenocrysts: Fsp 20% 1-4mm glomerophyric fresh; Px 10% 1-2mm fresh dark green 7. Matrix: fine grained 8. Secondary Minerals: minor alteration along outer rim, few vesicles on outermost cm filled with sediment	x_air freight box	x	2-3					
SO255-DR132-4	1. Rock Type: volcanic, mildly altered 2. Size: 16x15x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 20-40%, 1-2mm 6. Phenocrysts: Fsp 25% 1-4mm some weathering; Px 3% 1-2mm dark green 7. Matrix: fine grained 8. Secondary Minerals: altered Fsp	x_air freight box	x	3-4	GL			GNS	
SO255-DR132-5	1. Rock Type: volcanic, basalt, fresh 2. Size: 12x10x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 30%, <3mm 6. Phenocrysts: Fsp 15% <4mm; Px 1% <2mm; Ol <1% ~2mm 7. Matrix: fine grained				GL				

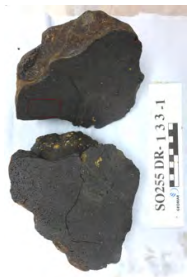
Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR132-6	1. Rock Type: volcanic, basalt, fresh weakly altered 2. Size: 16x11x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 35%, <5mm 6. Phenocrysts: Fsp 10% <4mm fresh; Px 5% few Ol <1% <1mm 7. Matrix: fine grained	missing?	x	2-3				GNS, back up	
SO255-DR132-7	1. Rock Type: volcanic, basalt 2. Size: 15x12x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 20%, <2mm 6. Phenocrysts: Fsp 5% <2mm; Ol ~5% <1mm 7. Matrix: fine grained	x_air freight box	x				GC in air-freight box		
SO255-DR132-8	1. Rock Type: volcanic, basalt 2. Size: 17x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to light grey 5. Texture / Vesicularity: near aphyric, vesicles 30%, <2mm 6. Phenocrysts: Ol 2-3% <1mm 7. Matrix: fine grained 10. Comment: minerals are very small, only Ol visible	x_air freight box	x						
SO255-DR132-9	1. Rock Type: volcanic, altered 2. Size: 25x23x19cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 30%, 2-18mm 6. Phenocrysts: Fsp 15% 1-4mm some alteration; Px 10% 1-2mm 7. Matrix: fine grained 10. Comment: GC has altered vesicles, difficult to prep for geochemistry	x_air freight box	x	3-4				GNS	
SO255-DR132-10	1. Rock Type: volcanic, basalt 2. Size: 23x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 3%, <6mm 6. Phenocrysts: Fsp 7% 4mm; Px 1% 4mm 7. Matrix: fine grained 8. Secondary Minerals: altrtaion of vesicles and veins and vesicle fillings, strong surface alteration 10. Comment: slightly altered vesicles are mostly round	x_air freight box	x	2-3					

SO255-DR133

Description of Location and Structure: Kermadec Ridge (Volcanic Front?), seamount directly West of Kermadec Ridge; SW-NE striking rift; alike to feature at E flank of seamount on midslope of Kermadec Ridge nearby

Dredge on bottom UTC 01/04/17 04:43hrs, lat 32 05.21'S, long 179 16,12'W, depth 2230m
Dredge off bottom UTC 01/04/17 06:07hrs, lat 32 5,24'S, long 179 15,63'W, depth 1830m
total volume: 1/3 full
Comments: abundant lava fragments. They posses variable proportions of Plg and Px and occassional Ol.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR133-1	1. Rock Type: volcanic, basalt, fresh 2. Size: 18x19x17cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20%, <6mm 6. Phenocrysts: Plg 10% <2mm; Px 5% <2mm; Ol 1% <1mm 7. Matrix: fine grained 10. Comment: very fresh minerals	x_air freight box	x					GNS	
SO255-DR133-2	1. Rock Type: volcanic, basalt, fresh 2. Size: 21x17x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 25%, 2-5mm 6. Phenocrysts: Plg 10% <2mm; Px 7% <1mm; Ol 5% <1mm 7. Matrix: fine grained 9. Encrustations: Mn crust <1mm 10. Comment: Plg/Px glomerocrysts, fractures up to 4cm with alteration filling	x_air freight box	x					GNS	
SO255-DR133-3	1. Rock Type: volcanic, basalt, fresh 2. Size: 21x17x17cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20%, <20mm 6. Phenocrysts: Px 5% <5mm; Ol 7-10% <4mm 7. Matrix: fine grained 9. Encrustations: Mn crust <1mm 10. Comment: refilled vesicles with other vesicular magmatic material but brownish - blackish. Late stage melts entering degassed areas							GNS	
SO255-DR133-4	1. Rock Type: volcanic, basaltic, fresh 2. Size: 21x17x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20%, <25mm 6. Phenocrysts: Plg <1% <3mm; Px 20% <3mm; Ol 10% <1mm 7. Matrix: fine grained 8. Secondary Minerals: <1mm Mn crust, glassy margin beneath? 10. Comment: vesicles filled with fresh lava parallel fractures up to 6.5cm	x_air freight box	x					GNS	
SO255-DR133-5	1. Rock Type: volcanic, basaltic, fresh 2. Size: 25x15x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 25%, <20mm, some filled with fresh lava 6. Phenocrysts: Plg 3% <2mm; Px 15-20% <3mm; Ol 1% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust, glass rim underneath? 10. Comment: fractures up to 4mm	x_air freight box	x		GL			GNS	

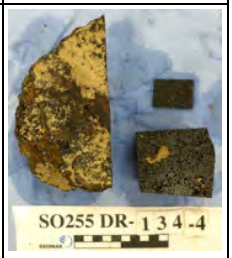
Appendix 2 (Station Details and Rock Description)

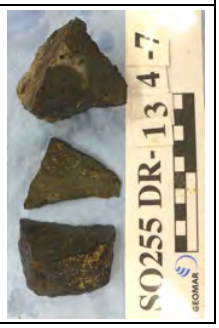
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR133-6	1. Rock Type: volcanic, basalt, fresh 2. Size: 21x17x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 3%, <40mm 6. Phenocrysts: Plg 7-10% <4mm; Px 5-7% <1mm; Ol 3% <1mm 7. Matrix: fine grained 9. Encrustations: Mn crust 10. Comment: fresh Ol, some fractures	x	x					GNS	
SO255-DR133-7	1. Rock Type: volcanic, basalt, fresh 2. Size: 18x16x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 15-20%, <12mm 6. Phenocrysts: Plg 7% <2mm; Px ~5% <2mm; Ol 1% <1mm 7. Matrix: fine grained 9. Encrustations: Mn crust <1mm							GNS	
SO255-DR133-8	1. Rock Type: volcanic, basalt, fresh 2. Size: 14x12x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20%, up to 8mm 6. Phenocrysts: Plg ~3% <2mm; Px <3% <2mm; Ol ~5% <3mm 7. Matrix: fine grained 9. Encrustations: Mn crust <1mm 10. Comment: fairly fresh Ol								
SO255-DR133-9	1. Rock Type: volcanic, basalt, fresh 2. Size: 15x11x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles ~20%, <6mm 6. Phenocrysts: Plg 10% <2mm; Px 7% <1mm; Ol ~1% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fractures up to 6cm long								
SO255-DR133-10	1. Rock Type: volcanic, basaltic, fresh 2. Size: 19x16x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 15%, up to 5mm 6. Phenocrysts: Px 10-15% <3mm; Ol 10% <3mm 7. Matrix: fine grained 10. Comment: vesicles filled with fresh lava, parallel fractures up to 12cm long								

SO255-DR134

Description of Location and Structure: Kermadec Ridge, 12nm S of DR133, W-facing slope of K.R. above basin along lower portion

Dredge on bottom UTC 01/04/17 09:13hrs, lat 32 17.82'S, long 179 17,38'W, depth 2954m
Dredge off bottom UTC 01/04/17 10:21hrs, lat 32 17,83'S, long 179 17,00'W, depth 2753m
total volume: full
Comments: volcaniclastics and breccias, some contain fairly fresh Plg-phyric lava clasts

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR134-1	1. Rock Type: volcaniclastic, hyaloclasite? fresh basaltic clast recovered from matrix 2. Size: 33x43x19cm original size of block D, sample piece 16x12x12cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% 6. Phenocrysts: Plg 15-20% <3mm; Px 5% <2mm; Ol 3% <1mm 7. Matrix: fine grained 9. Encrustations: 2mm Mn crust	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR134-2	1. Rock Type: clast recovered from breccia, basaltic lava, fresh 2. Size: 70x56x25cm original size of block O, sample piece 22x18x16cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% 6. Phenocrysts: Plg 15% <5mm; Px 3% <2mm; Ol 2% <2mm 7. Matrix: fine grained 9. Encrustations: <5mm Mn crust 10. Comment: similar to -1	x_air freight box	x					GNS	
SO255-DR134-3	1. Rock Type: clast recovered from breccia, basaltic lava, fresh 2. Size: 23x15x10cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% 6. Phenocrysts: Plg 10% <3mm; Px 5% <4mm; Ol 5% <1mm 7. Matrix: fine grained 9. Encrustations: <6mm Mn crust 10. Comment: similar to -1 and -2	x_air freight box	x						
SO255-DR134-4	1. Rock Type: clast recovered from breccia, basaltic lava, fresh 2. Size: 17x14x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 7% 6. Phenocrysts: Plg 25% <3mm; Px 5% <2mm; Ol 3% <1mm 7. Matrix: fine grained 10. Comment: similar to prev samples	x	x					GNS	
SO255-DR134-5	1. Rock Type: clast recovered from breccia, basaltic lava, fresh 2. Size: 22x10x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% 6. Phenocrysts: Plg 15% <5mm; Px 5% <2mm; Ol 3% <1mm 7. Matrix: fine grained 10. Comment: similar to prev. samples	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR134-6	1. Rock Type: basaltic lava, fresh, not clear if clast from breccia or free fragment 2. Size: 11x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% 6. Phenocrysts: Plg 20% <4mm; Px 3% <2mm; Ol 8% <2mm 7. Matrix: fine grained	x	x						
SO255-DR134-7	1. Rock Type: basaltic lava, fresh, not clear if clast from breccia or free fragment 2. Size: 11x5x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 8% 6. Phenocrysts: Plg 5% <2mm; Ol 8% <2mm; MT 1% <1mm 7. Matrix: fine grained	x	x					GNS	

SO255-DR135

Description of Location and Structure: Kermadec Ridge, W-flank 1nm from DR134. Mid slope track of a three track profile from bottom to top of Kermadec Ridge

Dredge on bottom UTC 01/04/17 12:42hrs, lat 32 19.52'S, long 179 17,10'W, depth 2275m
Dredge off bottom UTC 01/04/17 13:52hrs, lat 32 19,32'S, long 179 16,71'W, depth 1961m
total volume: 1/4 full
Comments: fresh Ol-Px phyric lava, some with fresh glass

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR135-1	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 38x27x19cm original size of block A, sample piece 14x14x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% 6. Phenocrysts: Ol 10% <4mm; Px 15% <1cm (large); Plg 10% <3mm 7. Matrix: fine grained 9. Encrustations: 2cm glass crust 10. Comment: phenocryst rich	x_air freight box	x		GL			GNS	
SO255-DR135-2	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 35x31x27cm original size of block P, sample piece 18x16x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% 6. Phenocrysts: Ol 10% <4mm; Px 15% <3mm (large); Plg 10% <3mm 7. Matrix: fine grained 10. Comment: similar to -1	x_air freight box	x					GNS	
SO255-DR135-3	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 25x20x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 3% 6. Phenocrysts: Ol 10% <2mm; Px 20% <1.1cm (large); Plg 8% <3mm 7. Matrix: fine grained 10. Comment: similar to prev. samples	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR135-4	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 14x11x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 7% 6. Phenocrysts: Ol 15% <2mm; Px 15% <6mm; Plg 7% <5mm 7. Matrix: fine grained 9. Encrustations: 5mm glassy rim				GL				
SO255-DR135-5	1. Rock Type: volcanic, basalt 2. Size: 16x11x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: glomerorphyric, vesicles 7% <9mm 6. Phenocrysts: Ol 10% <4mm; Px 15% <1cm (large); Plg 10% <3mm 7. Matrix: fine grained 9. Encrustations: 2cm glass crust 10. Comment: phenocryst rich								
SO255-DR135-6	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 47x32x24cm original size of block E, sample piece 21x15x19cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% up to 1.2cm most 1mm 6. Phenocrysts: Ol / Fsp intergrowth 7% <4mm; Px 1% <2mm; Ol 1% <3mm 7. Matrix: fine grained 9. Encrustations: 8mm glassy margin 10. Comment: phenocryst rich	x_air freight box	x		GL			GNS	
SO255-DR135-7	1. Rock Type: volcanic, basalt 2. Size: 40x31x26cm original size of block R, sample piece 18x10x10cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% 6. Phenocrysts: Ol 5% <6mm; Px 1% <3mm (large); Fsp 7% <5mm 7. Matrix: fine grained 9. Encrustations: 4mm glass crust	x	x		GL			GNS	
SO255-DR135-8	1. Rock Type: volcanic, basalt 2. Size: 36x10x17cm original size of block O, sample piece 16x12x12cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% <4mm 6. Phenocrysts: Ol 10% <6mm; Px 1% <1mm 7. Matrix: fine grained	x_air freight box	x		GL			GNS	
SO255-DR135-9	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 17x15x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% 6. Phenocrysts: Ol 5% <1mm; Px 15% <3mm 7. Matrix: fine grained	x_air freight box	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR135-10	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 19x15x12cm 3. Shape / Angularity: rounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 30% 6. Phenocrysts: Ol 5% <1mm; Px 10% <5mm (large); Plg 10% <7mm 7. Matrix: fine grained 9. Encrustations: 1cm glass crust	x_air freight box	x		GL			GNS	
SO255-DR135-11	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 13x11x10cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly porphyric, vesicles 3% 6. Phenocrysts: Ol 5% <1mm; Px 3% <1mm 7. Matrix: fine grained	x	x						
SO255-DR135-12	1. Rock Type: volcanic, pillow basalt, fresh 2. Size: 12x9x7cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 8% 6. Phenocrysts: Ol 3% <1mm; Px 5%; Plg 5% <3mm 7. Matrix: fine grained	x	x						
SO255-DR135-13	1. Rock Type: scoriaceous breccia 2. Size: 21x9x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: light brown grey 5. Texture / Vesicularity: monomictic 7. Matrix: fine grained brown mud 60% 10. Comment: largest scoria 1.1cm, 40% soria	x	x		GL				

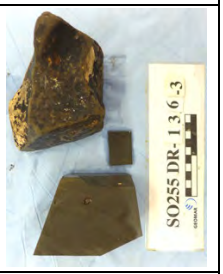
SO255-DR136

Description of Location and Structure: Kermadec Ridge, western flank 4nm E of DR135

Dredge on bottom UTC 01/04/17 15:41hrs, lat 32 21.58'S, long 179 13,02'W, depth 1180m
Dredge off bottom UTC 01/04/17 16:50hrs, lat 32 21,45'S, long 179 12,59'W, depth 972m
total volume: 1/3 full
Comments: several boulders of subrounded heavy lava, some volcaniclastic breccia fragments. -1 to -9 slightly altered Plg-Px phyric lava, no glass

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR136-1	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 33x21x21cm original size of block D, sample piece 21x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Plg 15-20% <1mm; Px 10% <1mm 7. Matrix: fine grained 8. Secondary Minerals: some vesicles are filled with flat white minerals ---> snow flake shape 9. Encrustations: <1mm Mn crust 10. Comment: altered rim but ~3cm fairly fresh core	x_air freight box	x				GC in air-freight box	GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR136-2	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 24x17x19cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 5% <2mm 6. Phenocrysts: Plg 5% <1mm; Px 10-15% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust, clastic rim attached with up to 1.5cm clasts	x_air freight box	x					GNS	
SO255-DR136-3	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 16x14x11cm 3. Shape / Angularity: angular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 5% <2mm 6. Phenocrysts: Plg 5% <1mm; Px 5% <1mm 7. Matrix: fine grained	x_air freight box	x						
SO255-DR136-4	1. Rock Type: volcanic, basaltic andesite 2. Size: 14x10x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 20% up to 4mm 6. Phenocrysts: Plg <9% <1mm; Px <5% <1mm 7. Matrix: fine grained	x	x						
SO255-DR136-5	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 22x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 15%, filled by clay minerals 6. Phenocrysts: Plg 3% <1mm; Px 1% <1mm both microphenocrysts 7. Matrix: fine grained 8. Secondary Minerals: clay minerals 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR136-6	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 35x16x15cm original size of block R, sample piece 20x18x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: aphyric, vesicles 20%, 3-5mm 10%, <1mm 10% 6. Phenocrysts: Plg 3% <1mm, microphenocrysts 7. Matrix: fine grained 8. Secondary Minerals: slight matrix alteration, altered vesicles and partially sediment filled vesicles	x	x					GNS	
SO255-DR136-7	1. Rock Type: volcanic, slightly altered 2. Size: 16x14x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, vesicles 20%, 3-7mm 15%, <1mm 5% 6. Phenocrysts: Fsp 3% <1mm; Px 1% <1mm 7. Matrix: fine grained 8. Secondary Minerals: slight alteration, some vesicles filled by sediment	x	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR136-8	1. Rock Type: volcanic, slightly altered 2. Size: 26x21x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, vesicles 25%, 1-10mm 20%, <1mm 5% 6. Phenocrysts: Fsp 3% <1mm; Px 2% <1mm 7. Matrix: fine grained 8. Secondary Minerals: slightly altered partly filled vesicles, large vesicles filled	x	x					GNS	
SO255-DR136-9	1. Rock Type: volcanic, basaltic andesite, slightly altered 2. Size: 17x13x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: nearly aphyric, vesicles 15% <6mm 6. Phenocrysts: Px ~3% <1mm; Fsp? 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	missing?	x						
SO255-DR136-10	1. Rock Type: sediment, volcaniclastic 2. Size: 19x14x11cm 3. Shape / Angularity: angular 4. Color of cut surface: consists of two parts; brown tuff breccia and yellow lapilli tuff 6. Phenocrysts: max 3cm ø clasts 7. Matrix: fine grained								
SO255-DR136-11	1. Rock Type: sediment, volcaniclastic 2. Size: 14x10x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: yellow 5. Texture / Vesicularity: volcanogenic, lapilli tuff 6. Phenocrysts: max 1.2cm ø black clasts, max 5mm altered clasts 7. Matrix: tufficeous								
SO255-DR136-12	1. Rock Type: sediment, volcaniclastic 2. Size: 26x22x16cm 3. Shape / Angularity: subrounded 4. Color of cut surface: reddish brown 5. Texture / Vesicularity: cracks filled with clay minerals 6. Phenocrysts: max 2mm ø black clasts 7. Matrix: medium grained clasts 8. Secondary Minerals: clay minerals 9. Encrustations: 1.2cm Mn crust								
SO255-DR136-13	1. Rock Type: sediment, volcaniclastic? 2. Size: 20x12x6cm 3. Shape / Angularity: rounded 4. Color of cut surface: green 5. Texture / Vesicularity: lined texture, altered? 6. Phenocrysts: max 3-5mm ø minerals or pebbles 7. Matrix: fine grained tufficeous 8. Secondary Minerals: clay minerals 9. Encrustations: <1mm Mn crust								

SO255-DR137

Description of Location and Structure: Kermadec Ridge, central section. W-facing slope of K.R., track at the very base of the slope. This and the two following dredges aim at sampling an upsection profile of the Western flank of the Kermadec Ridge

Dredge on bottom UTC 01/04/17 20:57hrs, lat 32 46.79'S, long 179 30,55'W, depth 2481m
Dredge off bottom UTC 01/04/17 22:17hrs, lat 32 46,98'S, long 179 30,18'W, depth 2052m
total volume: few rocks
Comments: Fsp rich lava fragments, altered

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR137-1	1. Rock Type: volcanic, andesite, altered 2. Size: 16x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: porphyric, moderate vesicular 20% <5mm variably filled with Mn, CC, Chl; Mn and Fe-oxide halo 6. Phenocrysts: Fsp 40% <3mm partly rel. fresh but many show various alteration features 7. Matrix: fine grained, brown altered matrix, fractures 8. Secondary Minerals: filled vesicles Mn- and Fe oxide, Chl?, CC and altered Fsp 10. Comment: low grade metamorphism, many alteration effects	x	x						
SO255-DR137-2	1. Rock Type: volcanic, andesite, altered 2. Size: 10x8x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: porphyric, strongly vesicular 30% <6mm variably filled with Mn, CC, Chl; Mn and Fe-oxide halo 6. Phenocrysts: Fsp 30% <4mm partly rel. fresh but also partly altered 7. Matrix: fine grained, brown altered matrix 8. Secondary Minerals: filled vesicles Mn- and Fe oxide, Chl?, CC; white core green rim 10. Comment: low grade metamorphism, multiple alteration processes	x_air freight box	x						
SO255-DR137-3	1. Rock Type: volcanic, andesite, altered 2. Size: 15x12x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: porphyric, srongly vesicular 30% <8mm filled with CC and Chl 6. Phenocrysts: Fsp 35% <4mm partly rel. fresh 7. Matrix: fine grained, greenish altered 8. Secondary Minerals: filled vesicles CC 8mm, Chl 3mm 10. Comment: low grade metamorphism	x_air freight box	x					GNS	
SO255-DR137-4	1. Rock Type: volcanic, andesite, altered; but seemingly the freshest sample of dredge 2. Size: 11x8x8cm 3. Shape / Angularity: angular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: porphyric, moderate vesicular 20% many small <1mm green Chl? filling, some large ~4mm; Chl and CC filling 6. Phenocrysts: Fsp 35% <4mm partly rel. fresh 7. Matrix: fine grained 8. Secondary Minerals: vesicles fillings Chl green, CC white, some filled cracks with Mn 9. Encrustations: thin Mn coating 10. Comment: sample with freshest Fsp of dredge	x_air freight box GC to be cut at GEOMAR	3				GC in air-freight box		

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR137-5	1. Rock Type: volcanic, andesite, altered 2. Size: 19x14x12cm 3. Shape / Angularity: angular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: porphyric, strongly vesicular 25% <2mm up to 1.5cm, filled with CC and Chl 6. Phenocrysts: Fsp 30% <4mm rel. fresh 7. Matrix: fine grained, greenish altered matrix 8. Secondary Minerals: CC in larger vesicles; Chl in smaller vesicles 10. Comment: low grade metamorphism?!	x	x					GNS	
SO255-DR137-6	1. Rock Type: volcaniclastic, altered 2. Size: 35x22x15cm original size of block D, sample piece 25x18x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: green - brown 5. Texture / Vesicularity: brecciated volcanic clasts ø 2-5cm, strongly vesicular 30% <5mm, CC white and Chl grenn filled 6. Phenocrysts: volcanic clasts contain few Fsp ~5% <2mm 7. Matrix: brecciated green 8. Secondary Minerals: large carbonate patches ~1cm, CC in vesicles, Chl in matrix and vesicles 9. Encrustations: thin Mn coating							GNS	
SO255-DR137-7	1. Rock Type: volcaniclastic, altered 2. Size: 18x15x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: green - grey 5. Texture / Vesicularity: brecciated volcanic clasts, phenocrysts and vesicles 6. Phenocrysts: Fsp in brecciated matrix ~20% <5mm 7. Matrix: volcanic clasts 10% <1.5cm 8. Secondary Minerals: CC, Chl, Fe-Oxide 10. Comment: back up sample								

SO255-DR138

Description of Location and Structure: Kermadec Ridge, central section. W-facing slope of K.R., 3nm S of DR137, mid section, one step further up

Dredge on bottom UTC 02/04/17 00:18hrs, lat 32 49.70'S, long 179 30,68'W, depth 1888m
Dredge off bottom UTC 02/04/17 01:37hrs, lat 32 49,55'S, long 179 30,31'W, depth 1473m
total volume: 1/5 full
Comments: various lava fragments / clasts recovered from breccias containing large angular lava clasts. They contain variable amounts of Px and Plg but Px dominates in most samples

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR138-1	1. Rock Type: large volcanic clast 10x10x15cm in brecciated consolidated mud, altered 2. Size: 22x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow matrix, clast brown - green 5. Texture / Vesicularity: clast; porphyric, moderate vesicular 10% <5mm open 6. Phenocrysts: Px 15% <4mm; Fsp 10% <2mm both fresh; Ol 5% <2mm weathered brown 7. Matrix: fine grained 8. Secondary Minerals: thin Mn crust ~1mm on entire rock 10. Comment: TS and GC of large clast	x_air freight box	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR138-2	1. Rock Type: large volcanic clast 7x5x3cm in brecciated volcaniclastic rock, altered 2. Size: 16x11x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow matrix, clast brown - green 5. Texture / Vesicularity: clast; porphyric, moderate vesicular 10% <4mm mostly open, some partly filled with sediment 6. Phenocrysts: Px 20% <6mm fresh partly weathered; Fsp 15% <2mm fresh; Ol? weathered brown 7. Matrix: fine grained 8. Secondary Minerals: partly altered Px 9. Encrustations: thin Mn coating whole rock 10. Comment: TS and GC of large clast	x_air freight box	x						
SO255-DR138-3	1. Rock Type: large volcanic clast 10x10x15cm in brecciated consolidated mud, altered 2. Size: 22x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow matrix, clast brown - green 5. Texture / Vesicularity: clast; porphyric, moderate vesicular 10% <5mm open 6. Phenocrysts: Px 15% <4mm; Fsp 10% <2mm both fresh; Ol 5% <2mm weathered brown 7. Matrix: fine grained 8. Secondary Minerals: thin Mn crust ~1mm on entire rock 10. Comment: TS and GC of large clast								
SO255-DR138-4	1. Rock Type: large volcanic clast 10x10x15cm in brecciated consolidated mud, altered 2. Size: 22x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow matrix, clast brown - green 5. Texture / Vesicularity: clast; porphyric, moderate vesicular 10% <5mm open 6. Phenocrysts: Px 15% <4mm; Fsp 10% <2mm both fresh; Ol 5% <2mm weathered brown 7. Matrix: fine grained 8. Secondary Minerals: thin Mn crust ~1mm on entire rock 10. Comment: TS and GC of large clast								
SO255-DR138-5	1. Rock Type: large volcanic clast 10x10x15cm in brecciated consolidated mud, altered 2. Size: 22x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow matrix, clast brown - green 5. Texture / Vesicularity: clast; porphyric, moderate vesicular 10% <5mm open 6. Phenocrysts: Px 15% <4mm; Fsp 10% <2mm both fresh; Ol 5% <2mm weathered brown 7. Matrix: fine grained 8. Secondary Minerals: thin Mn crust ~1mm on entire rock 10. Comment: TS and GC of large clast	x						GNS	
SO255-DR138-6	1. Rock Type: large volcanic clast 10x10x15cm in brecciated consolidated mud, altered 2. Size: 22x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow matrix, clast brown - green 5. Texture / Vesicularity: clast; porphyric, moderate vesicular 10% <5mm open 6. Phenocrysts: Px 15% <4mm; Fsp 10% <2mm both fresh; Ol 5% <2mm weathered brown 7. Matrix: fine grained 8. Secondary Minerals: thin Mn crust ~1mm on entire rock 10. Comment: TS and GC of large clast	x						GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR138-7	1. Rock Type: large volcanic clast 10x10x15cm in brecciated consolidated mud, altered 2. Size: 22x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow matrix, clast brown - green 5. Texture / Vesicularity: clast; porphyric, moderate vesicular 10% <5mm open 6. Phenocrysts: Px 15% <4mm; Fsp 10% <2mm both fresh; Ol 5% <2mm weathered brown 7. Matrix: fine grained 8. Secondary Minerals: thin Mn crust ~1mm on entire rock 9. Encrustations: 10. Comment: TS and GC of large clast							back up	
SO255-DR138-8	1. Rock Type: large volcanic clast 10x10x15cm in brecciated consolidated mud, altered 2. Size: 22x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow matrix, clast brown - green 5. Texture / Vesicularity: clast; porphyric, moderate vesicular 10% <5mm open 6. Phenocrysts: Px 15% <4mm; Fsp 10% <2mm both fresh; Ol 5% <2mm weathered brown 7. Matrix: fine grained 8. Secondary Minerals: thin Mn crust ~1mm on entire rock 10. Comment: TS and GC of large clast							back up	
SO255-DR138-9	1. Rock Type: large volcanic clast 10x10x15cm in brecciated consolidated mud, altered 2. Size: 22x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellow matrix, clast brown - green 5. Texture / Vesicularity: clast; porphyric, moderate vesicular 10% <5mm open 6. Phenocrysts: Px 15% <4mm; Fsp 10% <2mm both fresh; Ol 5% <2mm weathered brown 7. Matrix: fine grained 8. Secondary Minerals: thin Mn crust ~1mm on entire rock 10. Comment: TS and GC of large clast	x	x					GNS	

SO255-DR139

Description of Location and Structure: Kermadec Ridge, central section. Upper section of W-facing flank, track beneath flat topped plateau.

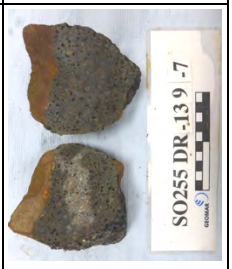
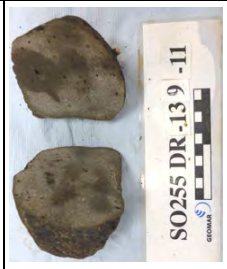
Dredge on bottom UTC 02/04/17 03:23hrs, lat 32 55.71'S, long 179 31,69'W, depth 995m
Dredge off bottom UTC 02/04/17 04:43hrs, lat 32 55,53'S, long 179 31,22'W, depth 633m
total volume: 3/4 full
Comments: various rounded to subrounded lava clasts, lots of fossil reef carbonate inkl. fossil coral, shells etc. The lava has been subdivided into 4-5 petrographycal groups but this information got lost during description by the other shift.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR139-1	1. Rock Type: volcanic, basalt, altered 2. Size: 20x16x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Px 7% <6mm; Fsp 2% <3mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 5% <5mm 10. Comment: orginally descibed here as highly altered but this is not true according to initial evaluation and pictures!	x_air freight box	x					GNS	

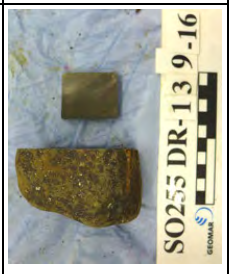
Appendix 2 (Station Details and Rock Description)

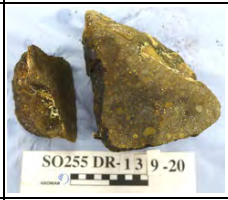
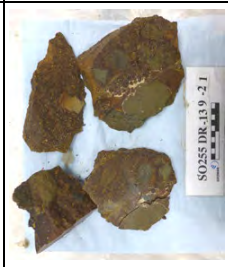
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR139-2	1. Rock Type: volcanic, basalt, altered 2. Size: 15x11x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Px 10% <5mm; Fsp 1% <2mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 4% <6mm 10. Comment: orginally descibed as highly altered but this is not true according to initial evaluation! Also zeolite filling of vesicles is described although the rock is desricbed as to have NO vesicles.	x_air freight box	x				GC in air-freight box		
SO255-DR139-3	1. Rock Type: volcanic, basalt, altered 2. Size: 16x10x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Px 5% <5mm; Fsp 5% <7mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 7% <3mm 10. Comment: orginally descibed as highly altered but this is not true according to initial evaluation!	x	x						
SO255-DR139-4	1. Rock Type: volcanic, basalt, altered 2. Size: 15x15x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, vesicles 10% <1mm 6. Phenocrysts: Px 5% <3mm; Fsp 2% <3mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 2% <5mm, zeolites? 15% <5mm 9. Encrustations: 9mm Mn crust, 1.5cm oxidized rim 10. Comment: orginally descibed as highly altered but this is not true according to initial evaluation!	x	x					GNS	
SO255-DR139-5	1. Rock Type: volcanic, basalt, altered 2. Size: 16x12x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 5% <1mm 6. Phenocrysts: Px 5-10% <5mm altered; Fsp 5% <4mm altered 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with CC 9. Encrustations: <1mm Mn crust 10. Comment: -5 to -8 described from different person than -1 to -4. More in alignment with initial evaluation.	x	x					GNS	
SO255-DR139-6	1. Rock Type: volcanic, basalt, altered 2. Size: 17x10x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 10-15% <1mm 6. Phenocrysts: Fsp 15% <5mm yellowish altered; Px 10% <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: -6 to -8 represent a more Fsp rich lava unit	x						GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR139-7	1. Rock Type: volcanic, basalt, altered 2. Size: 14x10x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light to dark grey 5. Texture / Vesicularity: porphyric, vesicles 5% <2mm 6. Phenocrysts: Fsp 10% <4mm; Px 10% <4mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with zeolith?, iddingsite <2mm 9. Encrustations: <1mm Mn crust 10. Comment: -6 to -8 represent a more Fsp rich lava unit	x							
SO255-DR139-8	1. Rock Type: volcanic, basalt, altered 2. Size: 15x13x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey to brownish 5. Texture / Vesicularity: porphyric, dense 6. Phenocrysts: Fsp 10-15% <2mm; Px 5% <2mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite <2% <1mm	x_air freight box	x				GC in air-freight box	GNS	
SO255-DR139-9	1. Rock Type: volcanic, basalt, altered 2. Size: 15x15x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, vesicles 10% <1mm 6. Phenocrysts: Px 5% <3mm; Fsp 2% <3mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 2% <5mm, zeolites? 15% <5mm 9. Encrustations: 9mm Mn crust, 1.5cm oxidized rim 10. Comment: -9 to -12 described by same rock describer who also did -1 to -4. This persons obviously totally overestimates the degree of alteration. Everything that is not pristine and glassy is described as highly altered. These rocks deserve a second look!	x							
SO255-DR139-10	1. Rock Type: volcanic, basalt, altered 2. Size: 10x10x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: neart aphyric, vesicles 4% <1mm 6. Phenocrysts: Px 2% <2mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 2% <2mm, zeolites 20% <5mm; hard to believe in grey basalt 10. Comment: -9 to -12 described by same rock describer who also did -1 to -4. This persons obviously totally overestimates the degree of alteration. Everything that is not pristine and glassy is described as highly altered. These rocks deserve a second look!	x							
SO255-DR139-11	1. Rock Type: volcanic, basalt, altered 2. Size: 15x10x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown grey 5. Texture / Vesicularity: porphyric, vesicles 5% <1cm 6. Phenocrysts: Px 3% <3mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 3% <2mm 10. Comment: -9 to -12 described by same rock describer who also did -1 to -4. This persons obviously totally overestimates the degree of alteration. Everything that is not pristine and glassy is described as highly altered. These rocks deserve a second look!	x							

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR139-12	1. Rock Type: volcanic, basalt, strongly altered groundmass but fresh Px and Fsp phenocrysts 2. Size: 22x21x20 original size og block E, sample pieces 17x12x9cm, 19x15x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyric, vesicles 7% <4mm 6. Phenocrysts: Px 15% <5mm; Fsp 5% <3mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 1% <2mm 9. Encrustations: <12mm Mn crust 10. Comment: -12 to -14 are a separate petrographic unit characterized by yellowish-brown altered groundmass with adundant fresh Px and minor Fsp.	x_air freight box	x					GNS	
SO255-DR139-13	1. Rock Type: volcanic, strongly altered groundmass but fresh Px and Fsp phenocrysts 2. Size: 40x18x11 original size of block P, sample pieces 20x13x7cm, 28x12x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish 5. Texture / Vesicularity: porphyric, vesicles 7% <4mm 6. Phenocrysts: Px black 10% <5mm; Fsp 5% <3mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: -12 to -14 are a separate petrographic unit characterized by yellowish-brown altered groundmass with adundant fresh Px and minor Fsp.	x_air freight box	x						
SO255-DR139-14	1. Rock Type: volcanic, strongly altered groundmass but fresh Px and Fsp phenocrysts, similar to -13 2. Size: 20x11x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish 5. Texture / Vesicularity: porphyric, vesicles 10% <5mm 6. Phenocrysts: Px 10-15% <5mm; Fsp ~5% <2mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with clear / transparent crystals 9. Encrustations: <1mm Mn crust 10. Comment: -12 to -14 are a separate petrographic unit characterized by yellowish-brown altered groundmass with adundant fresh Px and minor Fsp.	x	x					back up	
SO255-DR139-15	1. Rock Type: volcanic, basalt, altered 2. Size: 13x9x5cm 3. Shape / Angularity: subrounded to subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 2-3% <1mm 6. Phenocrysts: Px <5% <1mm; Fsp ~5% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR139-16	1. Rock Type: volcanic, basalt, altered 2. Size: 10x8x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 5% <2mm, long fractures 6. Phenocrysts: Px ~5% <1mm; Fsp? 7. Matrix: fine grained 8. Secondary Minerals: fractures filled with oxidized material, some vesicles filled with clear crystals zeolite? 9. Encrustations: <1mm Mn crust 10. Comment: initially -16 through -18 were identified as near aphyric, more evolved lava fragments with fairly fresh groundmass and some oxidation	x						GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR139-17	1. Rock Type: volcanic, altered 2. Size: 11x13x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey brown 5. Texture / Vesicularity: porphyric, vesicles 2% <1mm 6. Phenocrysts: Px ~2% <1mm 7. Matrix: fine grained 9. Encrustations: 2.1 cm multicolored breccia attached to lava fragment 10. Comment: initially -16 through -18 were identified as near aphyric, more evolved lava fragments with fairly fresh groundmass and some oxidation	x						GNS	
SO255-DR139-18	1. Rock Type: volcanic, altered 2. Size: 9x7x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey brown 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with white material 10% 10. Comment: initially -16 through -18 were identified as near aphyric, more evolved lava fragments with fairly fresh groundmass and some oxidation							back up	
SO255-DR139-19	1. Rock Type: scoria, breccia 2. Size: 33x24x15cm original size of block D, sample pieces 23x12x10cm, 23x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: black darkbrown 5. Texture / Vesicularity: polymict, vesicles 5% <2mm 7. Matrix: medium grained, 75% dark brown matrix 10. Comment: clasts <1.8cm							GNS	
SO255-DR139-20	1. Rock Type: volcaniclastic 2. Size: 20x17x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: multicolored 5. Texture / Vesicularity: polymict, clasts <1cm 7. Matrix: 40% dark brown matrix								
SO255-DR139-21	1. Rock Type: volcaniclastic breccia 2. Size: 90x50x40cm original size of block O, sample pieces 19x10x7cm, 10x13x10cm, 15x14x6cm, 17x14x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: rust grey 5. Texture / Vesicularity: polymict 7. Matrix: coarse grained rusty 10. Comment: lava clasts largest 2.8cm, use for geochemistry, contain Px and Plg; <5mm Px and Ol suspended in matrix								

SO255-DR140

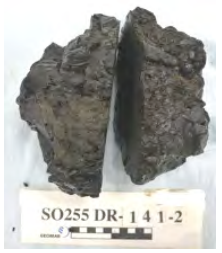
Description of Location and Structure: Havre Trough, immediately W of Kermadec Ridge. Ridge / volcano structure N of oval shaped basin; SSE facing slope from base to ridge crest

Dredge on bottom UTC 02/04/17 07:02hrs, lat 32 52.89'S, long 179 38,24'W, depth 3076m
Dredge off bottom UTC 02/04/17 08:15hrs, lat 32 52,53'S, long 179 38,41'W, depth 2238m
total volume: empty

SO255-DR141

Description of Location and Structure: Kermadec Vocanic Front, Hangaroa Volcano eastern lower-mid flank

Dredge on bottom UTC 02/04/17 11:27hrs, lat 32 37.93'S, long 179 34,85'W, depth 1799m
Dredge off bottom UTC 02/04/17 12:25hrs, lat 32 37,68'S, long 179 35,09'W, depth 1544m
total volume: 1/2 full
Comments: fresh, near aphyric lava with minor Px. Fresh glass described but not marked as being cut off.

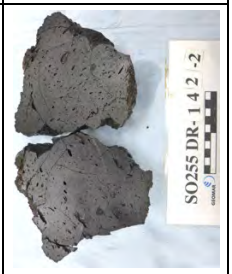
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR141-1	1. Rock Type: basaltic andesite, fresh 2. Size: 27x16x17cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly porphyric to near aphyric, vesicles 10% <9mm 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 1cm glass rind on both sides	x_air freight box	x						
SO255-DR141-2	1. Rock Type: basaltic andesite, fresh 2. Size: 20x17x10cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly porphyric to near aphyric, vesicles 15% <10mm 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 1cm glass rind on both sides	x_air freight box	x						
SO255-DR141-3	1. Rock Type: basaltic andesite, fresh 2. Size: 22x17x10cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly porphyric to near aphyric, vesicles 15% <20mm 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 6mm glass rind on both sides	x	x						
SO255-DR141-4	1. Rock Type: basaltic andesite, fresh 2. Size: 21x20x11cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly porphyric to near aphyric, vesicles 10% <7mm 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 1cm glass rind on both sides	x	x						
SO255-DR141-5	1. Rock Type: basaltic andesite, fresh 2. Size: A; 10x5x6cm, B; 13x9x8cm, C; 10x8x5cm, D; 9x7x8cm, E; 5x9x8cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly porphyric to near aphyric, vesicles 15% <9mm 6. Phenocrysts: Px 1% <1mm; Plg 1% <1mm 7. Matrix: fine grained 10. Comment: not clear what A through E represents; presumably individual back up pieces, still Fsp described for the first time.							back up pieces??	
SO255-DR141-6	1. Rock Type: basaltic andesite, fresh 2. Size: 8x7x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly porphyric to near aphyric, vesicles 10% <5mm 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 8mm glass rind on both sides 10. Comment: 1.3cm ø xenolith								

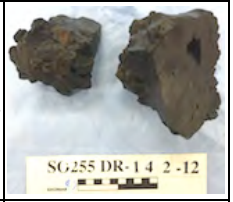
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR141-7	1. Rock Type: glass, no indication on description sheet on amount, size, if from individual pieces, therefore each fragment should be treated separately! 7. Matrix: fine grained								
SO255-DR141-8	1. Rock Type: pillow, display piece similar to -1 through -6 2. Size: 29x24x20 7. Matrix: fine grained							display piece	
SO255-DR141-9	1. Rock Type: basaltic andesite 2. Size: 11x10x9 7. Matrix: fine grained 10. Comment: similar to -1 through -6; completely to GNS; uniform lava flow							entirely to GNS	
SO255-DR141-10	1. Rock Type: basaltic andesite 2. Size: 19x19x8 7. Matrix: fine grained 10. Comment: similar to -1 through -6; completely to GNS; uniform lava flow							entirely to GNS	
SO255-DR141-11	1. Rock Type: basaltic andesite 2. Size: 14x13x11 7. Matrix: fine grained 10. Comment: similar to -1 through -6; completely to GNS; uniform lava flow							entirely to GNS	
SO255-DR141-12	1. Rock Type: basaltic andesite 2. Size: A: 11x10x9cm, B: 12x10x9cm, C: 9x6x4cm, D: 9x7x6cm, E: 8x8x9cm 7. Matrix: fine grained 10. Comment: similar to -1 through -6; completely to GNS; uniform lava flow							entirely to GNS	

SO255-DR142

Description of Location and Structure: Kermadec Vocanic Front, Hangaroa Volcano, upper most section just below top of the cone; E of DR141

Dredge on bottom UTC 02/04/17 11:27hrs, lat 32 37.53'S, long 179 37,35'W, depth 1024m
Dredge off bottom UTC 02/04/17 14:52hrs, lat 32 37,22'S, long 179 37,42'W, depth 758m
total volume: 1/4 full
Comments: fresh, slightly Px-Plg phyrirc lava, dredge from a compositionally unifrom lava flow

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR142-1	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 21x16x11cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 15% 6. Phenocrysts: Px 2% <1mm 7. Matrix: fine grained 9. Encrustations: chilled margin no glass 10. Comment: similar to DR141 samples	x_air freight box	x						
SO255-DR142-2	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 16x12x11cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 20% 6. Phenocrysts: 3-5% Plg <1mm; Px 3% <1mm 7. Matrix: fine grained 9. Encrustations: chilled margin no glass 10. Comment: similar to -1 but contains Plg	x_air freight box	x				TS box 64-		
SO255-DR142-3	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 20x14x13cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 15% 6. Phenocrysts: Plg 5% <1mm; Px 2% <1mm; Plg/Px glomerocrysts 7. Matrix: fine grained 9. Encrustations: chilled margin with glass 10. Comment: similar to -2	x_air freight box	x		GL				
SO255-DR142-4	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 20x14x12cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 15% 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 10. Comment: similar to -1, no Plg								
SO255-DR142-5	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 10x9x8cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 10% 6. Phenocrysts: Plg 2% <1mm; Px 2% <1mm 7. Matrix: fine grained 10. Comment: similar to -2 and -3								
SO255-DR142-6	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 10x10x8cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 15% 6. Phenocrysts: Plg 2% <1mm; Px 2% <1mm 7. Matrix: fine grained 10. Comment: similar to -2, -3 and -5								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR142-7	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 13x10x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 20% 6. Phenocrysts: Plg 1% <1mm; Px 2% <1mm 7. Matrix: fine grained 10. Comment: similar to -2, -3, -5 and -6								
SO255-DR142-8	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 16x10x8cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 25% 6. Phenocrysts: Plg 1% <2mm; Px 2% <1mm 7. Matrix: fine grained 10. Comment: similar to -2, -3, -5, -6 and -7	x	x						
SO255-DR142-9	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 15x12x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 15% 6. Phenocrysts: Plg 1% <1mm; Px 2% <1mm 7. Matrix: fine grained 10. Comment: similar to -2, -3, -5, -6, -7 and -8	x	x						
SO255-DR142-10	1. Rock Type: glass, no indication on description sheet on amount, size, if from individual pieces, therefore each fragment should be treated separately! 7. Matrix: fine grained				GL				
SO255-DR142-11	1. Rock Type: volcanic, basaltic pillow, fresh 2. Size: 10x9x6cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric to near aphyric, vesicles 15% 6. Phenocrysts: Plg 2% <1mm; Px 2% <2mm 7. Matrix: fine grained								
SO255-DR142-12	1. Rock Type: volcanic, basalt, pillow, fresh 2. Size: 19x11x11cm 7. Matrix: fine grained 10. Comment: same as -1 to -7, entirely to GNS, entire dredge is a uniform lava flow							entirely to GNS	
SO255-DR142-13	1. Rock Type: volcanic, basalt, pillow, fresh 2. Size: 16x10x8cm 7. Matrix: fine grained 10. Comment: same as -1 to -7, entirely to GNS, entire dredge is a uniform lava flow							entirely to GNS	
SO255-DR142-14	1. Rock Type: volcanic, basalt, pillow, fresh 2. Size: 17x12x12cm 7. Matrix: fine grained 10. Comment: same as -1 to -7, entirely to GNS, entire dredge is a uniform lava flow							entirely to GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR142-15	1. Rock Type: volcanic, basalt, pillow, fresh 2. Size: 14x12x11cm 7. Matrix: fine grained 10. Comment: same as -1 to -7, entirely to GNS, entire dredge is a uniform lava flow							entirely to GNS	

SO255-NET143

Description of Location and Structure: Havre Trough

Net in water UTC 02/04/17 17:17hrs, lat 32 52.29'S, long 179 47,01'W, depth 2880m
Net on deck UTC 02/04/17 17:45hrs, lat 32 53,06'S, long 179 47,67'W, depth 3054m

SO255-DR144

Description of Location and Structure: Havre Trough, northern flank of deep basin, 15nm north of DR140

Dredge on bottom UTC 02/04/17 19:07hrs, lat 32 54.05'S, long 179 48,50'W, depth 3351m
Dredge off bottom UTC 02/04/17 20:08hrs, lat 32 53,76'S, long 179 48,50'W, depth 3079m
total volume: few rocks
Comments: semi consolidated mud and Mn crust ---> no samples taken

SO255-DR145

Description of Location and Structure: Havre Trough, central profile. Area of NE-SW striking ridges, S facing flank from bottom to top, 3nm NW of DR144

Dredge on bottom UTC 02/04/17 22:39hrs, lat 32 52.52'S, long 179 51,62'W, depth 2905m
Dredge off bottom UTC 02/04/17 23:55hrs, lat 32 52,12'S, long 179 51,62'W, depth 2392m
total volume: one rock
Comments: slightly altered, near aphyric Plg-Px lava

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR145-1	1. Rock Type: volcanic, mild alteration, chilled margin 2. Size: 9x9x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, vesicles 50% total, 45% <1mm, 5% 2-4mm 6. Phenocrysts: Fsp 1% <1mm; Px <1% <1mm 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: difficult to prepare GC slab, because of Mn and alteration		x		GL			GNS	

SO255-DR146

Description of Location and Structure: Havre Trough, central profile. Irregular shaped basin 20nm NW of Kermadec Ridge, basin floor has topography at the 20m interval level. Small cone at NE end of basin, could be a pillow mound

Dredge on bottom UTC 03/04/17 03:26hrs, lat 32 49.10'S, long 179 59,13'E, depth 4121m
Dredge off bottom UTC 03/04/17 04:19hrs, lat 32 48,84'S, long 179 59,14'E, depth 4026m
total volume: empty

SO255-DR147

Description of Location and Structure: Havre Trough, central profile. NW margin of basin, 2nm W of DR146, SE flank from bottom to top

Dredge on bottom UTC 03/04/17 07:35hrs, lat 32 48.57'S, long 179 55,00'E, depth 3963m

Dredge off bottom UTC 02/04/17 08:58hrs, lat 32 48,14'S, long 179 54,83'E, depth 3591m

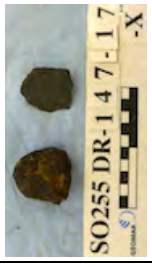
total volume: few small rocks, chain back turned inside out

Comments: mostly basalts, one plutonic rock, some sediments. After -14 is a series of backup samples labelled -1X through -9X. They are extra pieces and DO NOT correspond to the earlier sample numbers. As the slope is at the margin of the basin the samples may represent older Havre basement. They are mostly, fairly fresh, slightly Ol phyric lavas that sometimes also contain Px and very rarely Fsp.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR147-1	1. Rock Type: basalt 2. Size: 12x10x9cm 3. Shape / Angularity: angular 4. Color of cut surface: black grey 5. Texture / Vesicularity: very slightly phyric, vesicles 15% <4mm 6. Phenocrysts: Ol 1% <1mm; Px <1% <2mm 7. Matrix: fine grained 9. Encrustations: 1cm beige sediment attached, <1mm Mn crust	x	x					GNS	
SO255-DR147-2	1. Rock Type: basalt 2. Size: 15x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: very slightly phyric, vesicles 15% <5mm 6. Phenocrysts: Ol 1% <1mm; Plg <1% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR147-3	1. Rock Type: basalt 2. Size: 11x9x7cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: very slightly phyric, vesicles 7% <2mm 6. Phenocrysts: Ol 3% <2mm; single 2mm Px/Ol glomerocryst 7. Matrix: fine grained 8. Secondary Minerals: 10% zeolites <4mm 9. Encrustations: 3mm glass rim 10. Comment: 3mm glass and 10% zeolites are somewhat contradictional	x	x					GNS	
SO255-DR147-4	1. Rock Type: volcanic, mafic plutonic? 2. Size: 11x8x9cm 3. Shape / Angularity: angular 4. Color of cut surface: grey-blue 5. Texture / Vesicularity: holocrystalline 6. Phenocrysts: not described 7. Matrix: fine grained	x	x					GNS	
SO255-DR147-5	1. Rock Type: volcaniclastic, contains plutonic rocks 2. Size: 14x10x4cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: volcaniclastic 6. Phenocrysts: 3x4x6cm mafic plutonic, altered 5mm ø clasts 7. Matrix: medium grained matrix 8. Secondary Minerals: clay minerals	x						GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR147-6	1. Rock Type: volcanic, basalt, fresh 2. Size: 6x6x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% 6. Phenocrysts: Ol 20% <2mm 7. Matrix: fine grained 9. Encrustations: 1cm chilled margin	x						GNS	
SO255-DR147-7	1. Rock Type: volcanic, andesite, strongly altered 2. Size: 8x6x5cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: grey, altered areas yellow 5. Texture / Vesicularity: dense, fracture filled with clay minerals 6. Phenocrysts: Plg 3% <1mm; Px <3% <1mm 7. Matrix: fine grained 8. Secondary Minerals: clay minerals	x	x						
SO255-DR147-8	1. Rock Type: volcanic, basalt, fresh, pebble size 2. Size: 8x6x4cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% 6. Phenocrysts: Ol 15% <1mm 7. Matrix: fine grained 10. Comment: fresh Ol basalt but small	x	x						
SO255-DR147-9	1. Rock Type: volcanic, basalt, fresh, pebble size 2. Size: 7x5x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% 6. Phenocrysts: Ol 10-15% max 1mm 7. Matrix: fine grained 10. Comment: fresh Ol basalt small								
SO255-DR147-10	1. Rock Type: volcanic, basalt, fresh, pebble size 2. Size: 6x5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 3% 6. Phenocrysts: Ol 5-10% most <1mm max 2mm 7. Matrix: fine grained 10. Comment: fresh Ol basalt small								
SO255-DR147-11	1. Rock Type: volcanic, basalt, fresh, pebble size 2. Size: 6x5x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% 6. Phenocrysts: Ol 10-15% max 2mm, mostly <1mm 7. Matrix: fine grained 10. Comment: fresh Ol basalt small								
SO255-DR147-12	1. Rock Type: volcanic, basalt, fresh, pebble size 2. Size: 6x5x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% 6. Phenocrysts: Ol 5-10% <2mm 7. Matrix: fine grained: 10. Comment: fresh Ol basalt small								

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR147-13	1. Rock Type: seafloor sediment 2. Size: 5x5x4cm 3. Shape / Angularity: rounded 4. Color of cut surface: medium brown 5. Texture / Vesicularity: vesicles 2% <1cm 6. Phenocrysts: Ol 10-15% max 1mm 7. Matrix: fine grained								
SO255-DR147-14	1. Rock Type: deep sea sediment with vesicular mafic clast 2. Size: 5 pieces <3x2x3cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey brown 5. Texture / Vesicularity: vesicles 2% <1cm 7. Matrix: fine grained 10. Comment: <1mm black spots, clast 2.4 x2.5cm								
SO255-DR147-15X	1. Rock Type: volcanic, basalt 2. Size: 4.5x4x3.5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey black 5. Texture / Vesicularity: porphyric, vesicles 10% <2mm 6. Phenocrysts: Ol 3% <2mm 7. Matrix: fine grained 8. Secondary Minerals: zeolites in veins 9. Encrustations: <1mm Mn crust 10. Comment: chilled margin								
SO255-DR147-16X	1. Rock Type: volcanic, basalt 2. Size: 6x5.5x3.5cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey black 5. Texture / Vesicularity: vesicles 15% <1mm 6. Phenocrysts: Ol 1% <1mm 7. Matrix: fine grained 8. Secondary Minerals: zeolites 9. Encrustations: 2mm brown sediment								
SO255-DR147-17X	1. Rock Type: volcanic, basalt 2. Size: 5x4x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 5% 6. Phenocrysts: Ol 5% <1mm 7. Matrix: fine grained								
SO255-DR147-18X	1. Rock Type: volcanic, basalt 2. Size: 6x5x4cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% 6. Phenocrysts: Ol 2% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm sediment								

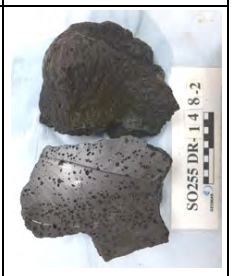
Appendix 2 (Station Details and Rock Description)

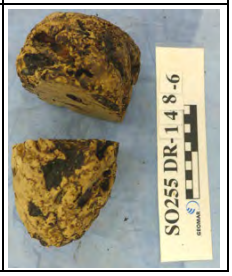
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR147-19X	1. Rock Type: volcanic, basalt 2. Size: 6x4x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% 6. Phenocrysts: Ol 1% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm sediment attached								
SO255-DR147-20X	1. Rock Type: volcanic, basalt 2. Size: 4x4x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey black 5. Texture / Vesicularity: vesicles 25% 6. Phenocrysts: Ol 1% <0.5mm 7. Matrix: fine grained 9. Encrustations: <2mm sediment								
SO255-DR147-21X	1. Rock Type: volcanic, basalt 2. Size: 4.5x5x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: vesicles 7% <2mm 6. Phenocrysts: Ol 1% <1mm 7. Matrix: fine grained 9. Encrustations: 2mm sediment attached								
SO255-DR147-22X	1. Rock Type: volcanic, basalt 2. Size: 6.5x4.5x4cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: vesicles 20% <1.2cm 6. Phenocrysts: Ol 1% <1mm; Px <1% <1mm; Plg <1% <1mm 7. Matrix: fine grained 8. Secondary Minerals: zeolites in veins 9. Encrustations: 1mm brown sediment under <1mm Mn crust 10. Comment: chilled margin								
SO255-DR147-23X	1. Rock Type: volcanic, basalt 2. Size: 6x4.5x3cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: vesicles 10% <2mm 6. Phenocrysts: Ol 1% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust								
SO255-DR147-24	1. Rock Type: basalt 2. Size: 16x small pieces all c. 6x5x4cm 10. Comment: similar to -1 through -3, all 16 pieces go completely to GNS							entirely to GNS	

SO255-DR148

Description of Location and Structure: Havre Trough, central profile. NE margin of basin, ridge structure, 9nm NE of DR147

Dredge on bottom UTC 03/04/17 12:23hrs, lat 32 40.84'S, long 179 58,11'W, depth 3115m
Dredge off bottom UTC 03/04/17 15:26hrs, lat 32 40,51'S, long 179 58,11'W, depth 2810m
total volume: few rocks
Comments: fresh lava, sediments and one pumice, few pillow fragments with glassy margins. All lava is Plg phyric with Px and very minor Ol.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR148-1	1. Rock Type: volcanic, basalt, fresh 2. Size: 30x25x23cm original size of block D, sample pieces 19x12x10cm, 9x15x8cm 3. Shape / Angularity: subangular to subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 15-20% <4mm 6. Phenocrysts: Plg 15% <3mm; Px 5% <3mm; Ol <1% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm glass rim and Mn crust 10. Comment: fresh glass for EMP and LA-ICPMS	x	x		GL			GNS	
SO255-DR148-2	1. Rock Type: volcanic, basalt, fresh 2. Size: 29x28x19cm original size of block R, sample piece 21x16x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 10% <3mm 6. Phenocrysts: Plg 2% <1mm; Px 5% <2mm; Ol? <1% <1mm 7. Matrix: fine grained 9. Encrustations: 5mm glass rim and <1mm Mn crust	x	x		GL				
SO255-DR148-3	1. Rock Type: volcanic, basalt, fresh 2. Size: 12x18x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 25-30% <2mm 6. Phenocrysts: Plg 5-10% <2mm; Ol <3% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR148-4	1. Rock Type: volcanic, basalt, fresh 2. Size: 11x7x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 15-20% <2mm 6. Phenocrysts: Plg 5% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust; 1mm palagonite / chilled margin	x							
SO255-DR148-5	1. Rock Type: felsic pumice, altered 2. Size: 10x6x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 15% <4mm 6. Phenocrysts: Amph 3-5% <1mm; Plg 5% <1mm 7. Matrix: fine grained								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR148-6	1. Rock Type: sediment altered 2. Size: 18x8x8cm 3. Shape / Angularity: subrounded to subangular 4. Color of cut surface: beige 5. Texture / Vesicularity: vesicles 10% <2cm 7. Matrix: fine sand								

SO255-DR149

Description of Location and Structure: Havre Trough, central profile. Lower flank of ridge structure between "rifted" backarc seamounts

Dredge on bottom UTC 03/04/17 16:25hrs, lat 32 35.61'S, long 179 57,65'E, depth 3614m
Dredge off bottom UTC 03/04/17 17:32hrs, lat 32 35,31'S, long 179 57,60'E, depth 3256m
total volume: two rocks
Comments: freah Px-Pl lava with fresh glass

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR149-1	1. Rock Type: volcanic, basalt, fresh, glass 2. Size: 25x30x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 5% <2mm 6. Phenocrysts: Px 5-10% <6mm; Ol <2% <4mm 7. Matrix: fine grained 9. Encrustations: 2-3mm glass rim and Mn crust <1mm	x	x		GL			GNS	
SO255-DR149-2	1. Rock Type: volcanic, basalt, fresh 2. Size: 11x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 5% <2mm 6. Phenocrysts: Px 5-10% <4mm; Ol <2% <3mm 7. Matrix: fine grained 9. Encrustations: Mn crust <1mm 10. Comment: fresh Ol								

SO255-DR150

Description of Location and Structure: Havre Trough, central profile. NE-SW trending ridge / step crossing NW-SE striking basin. SE facing slope from base to top

Dredge on bottom UTC 03/04/17 21:27hrs, lat 32 30.45'S, long 179 40,18'E, depth 3910m
Dredge off bottom UTC 03/04/17 22:24hrs, lat 32 30,19'S, long 179 40,11'E, depth 3650m
total volume: very few rocks
Comments: pumice only, two reference pieces taken, rest by UTAS

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR150-1	1. Rock Type: volcanic, pumice 2. Size: 7x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown 5. Texture / Vesicularity: glassy, strongly vesicular 40% <7mm, pumiceous 6. Phenocrysts: Fsp 10% <3mm; Px 10% <3mm 7. Matrix: glassy 10. Comment: uncut								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR150-2	1. Rock Type: volcanic, pumice, scoria 2. Size: 7x6x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark-brown 5. Texture / Vesicularity: glassy, strongly vesicular 45% <12mm, pumiceous, partly filled with sediment 6. Phenocrysts: not visible 7. Matrix: glassy 9. Encrustations: thin Mn coating 10. Comment: uncut								

SO255-DR151

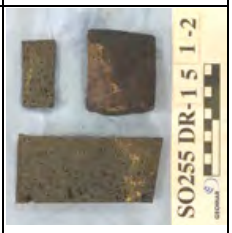
Description of Location and Structure: Havre Trough, central profile. NE-SW striking ridge at termination / intersection with NW-SE basin. SE dipping slope from base to top.

Dredge on bottom UTC 04/04/17 01:23hrs, lat 32 26.52'S, long 179 42,34'E, depth 3489m

Dredge off bottom UTC 04/04/17 02:59hrs, lat 32 26,09'S, long 179 42,26'E, depth 2850m

total volume: few rocks

Comments: lava fragments, some pillows? Four different petrographic lava units identified. -1 to -7 Ol-basalt, -8 aphyric, -9 to -11 Px phyric, -12 to -13 Fsp phyric

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR151-1	1. Rock Type: volcanic, basalt, Ol phyric unit 2. Size: 13x20x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, moderate vesicular 15% <5mm, open 6. Phenocrysts: Ol 15% <4mm fresh weakly altered; Px 1% <1mm fresh 7. Matrix: fine grained 9. Encrustations: ~3mm Mn crust, glassy rim 10. Comment: belongs to Ol basalt unit -1 to -7	x	x		GL				
SO255-DR151-2	1. Rock Type: volcanic, basalt, Ol phyric unit 2. Size: 24x18x17cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, highly vesicular 30% <5mm, partly filled with sediment 6. Phenocrysts: Fsp 20% <3mm grey weathered; Ol 1% <1mm fresh 7. Matrix: fine grained 9. Encrustations: glassy rim ~8mm, Mn crust ~1cm 10. Comment: grouped to Ol basalt unit -1 to -7 but closer inspection reveals abundant Fsp	x	x		GL			GNS	
SO255-DR151-3	1. Rock Type: volcanic, basalt, Ol phyric unit 2. Size: 11x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, moderate vesicular 15% <4mm, open some filled with sediment 6. Phenocrysts: Ol 10% <3mm fresh 7. Matrix: fine grained 9. Encrustations: ~3mm Mn crust 10. Comment: belongs to Ol basalt unit -1 to -7	x	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR151-4	1. Rock Type: volcanic, basalt, Ol phyric unit 2. Size: 7x7x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, moderate vesicular 20% <5mm, partly filled with altered brownish volcanic material 6. Phenocrysts: Ol 15% <4mm 7. Matrix: fine grained 9. Encrustations: ~2mm Mn crust, glassy rim 10. Comment: belongs to Ol basalt unit -1 to -7				GL				
SO255-DR151-5	1. Rock Type: volcanic, basalt, Ol phyric unit 2. Size: 12x11x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black, dark grey 5. Texture / Vesicularity: porphyric 5% phenocrysts, vesicles 40%, 1-4mm 10%, <1mm 30% 6. Phenocrysts: Ol 5% <1mm partly fresh 7. Matrix: fine grained 8. Secondary Minerals: some alteration, Mn in veins 9. Encrustations: some filled vesicles with sediment 10. Comment: belongs to Ol basalt unit -1 to -7	x	x						
SO255-DR151-6	1. Rock Type: volcanic, basalt, Ol phyric unit, some alteration and vesicle filling 2. Size: 9x9x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric 15-20% phenocrysts, moderate vesicular 40%, 1mm 10%, <1mm 30% 6. Phenocrysts: Ol 15-20% <2mm mostly fresh 7. Matrix: fine grained 9. Encrustations: thin Mn coating & in groundmass?, Mn vesicle fillings 10. Comment: blongs to Ol basalt unit -1 to -7	x	x						
SO255-DR151-7	1. Rock Type: volcanic, basalt, Ol phyric unit, four back up samples 2. Size: 8x7x6cm, 8x7x7cm, 9x9x6cm, 8x7x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric 10-25%, vesicles 10-20% 6. Phenocrysts: Ol 10-20% <2mm 7. Matrix: fine grained 9. Encrustations: 1-5mm Mn crust 10. Comment: blongs to Ol basalt unit -1 to -7, back up samples							back up	
SO255-DR151-8	1. Rock Type: volcanic, basalt, aphyric unit 2. Size: 28x20x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric, vesicles 15% ~5mm 6. Phenocrysts: Px microphenocrysts <<0.2mm under binocular 7. Matrix: fine grained 9. Encrustations: 5mm Mn crust 10. Comment: aphyric lava unit	x	x		GL			GNS	
SO255-DR151-9	1. Rock Type: volcanic, basalt, slightly Px phyric unit 2. Size: 15x10x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: near aphyric, vesicles 7% <9mm 6. Phenocrysts: Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: slightly Px phyric unit	x	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR151-10	1. Rock Type: volcanic, basalt, slightly Px phyric unit 2. Size: 11x10x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: slightly phyric, vesicles 7% <5mm 6. Phenocrysts: Px 2% <2mm 7. Matrix: fine grained 9. Encrustations: 4mm Mn crust 10. Comment: slightly Px phyric unit	x	x					GNS	
SO255-DR151-11	1. Rock Type: volcanic, basalt, slightly Px phyric unit 2. Size: 9x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: slightly phyric, vesicles 7% <4mm 6. Phenocrysts: Px 3% <2mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust 10. Comment: slightly Px phyric unit							back up	
SO255-DR151-12	1. Rock Type: volcanic, basalt, Fsp phyric unit 2. Size: 17x9x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 1% <1mm 6. Phenocrysts: Px 3% <2mm; Fsp 2% <2mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite <1% <1mm 9. Encrustations: 3mm Mn crust 10. Comment: Fsp phyric lava unit	x	x					GNS	
SO255-DR151-13	1. Rock Type: volcanic, basalt, fresh, Fsp phyric unit 2. Size: 10x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 10% <10mm 6. Phenocrysts: Plg 5% <4mm; Px 3% <2mm; Ol 1% <1mm 7. Matrix: fine grained 9. Encrustations: <2mm Mn crust 10. Comment: Fsp phyric lava unit	x							
SO255-DR151-14	1. Rock Type: volcaniclastic, contains medium sized clasts 2. Size: 19x15x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: dense 6. Phenocrysts: 2.5x2cm Plg-Px andesite clast; 2.5x1.5cm Plg-Px andesite clast, 1x1cm altered Plg-Px clast 7. Matrix: matrix supported 9. Encrustations: <1mm Mn crust	x						GNS	

SO255-DR152

Description of Location and Structure: Havre Trough, central profile. Oval shaped NE-SW striking seamount on NE-SW striking ridge that separates two basins. SE-flank bottom to top.

Dredge on bottom UTC 04/04/17 07:11hrs, lat 32 11.42'S, long 179 46,61'E, depth 3112m
Dredge off bottom UTC 04/04/17 08:22hrs, lat 32 11,05'S, long 179 46,55'E, depth 2638m
total volume: one rock
Comments: Ol-Px-Plg basalt, fresh, no glass

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR152-1	1. Rock Type: volcanic, basalt 2. Size: 12x7x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, vesicules 15-20% <5mm 6. Phenocrysts: Ol 15-20% <4mm; Px 2-3% <2mm fresh; Plg 3% <3mm 7. Matrix: fine grained 9. Encrustations: <7mm Mn crust 10. Comment: very fresh Ol	x	x						

SO255-DR153

Description of Location and Structure: Havre Trough, central profile. Small cone in western Havre Trough; Southern flank

Dredge on bottom UTC 04/04/17 11:12hrs, lat 32 09.85'S, long 179 37,72'E, depth 3160m
Dredge off bottom UTC 04/04/17 12:11hrs, lat 32 09,60'S, long 179 37,88'E, depth 2884m
total volume: five rock
Comments: pumice, eventually sampled by UTAS, none taken by GEOMAR, two small pieces taken by GNS but not in CTIMM list

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR153-1	1. Rock Type: volcanic, basalt 2. Size: 3. Shape / Angularity: 4. Color of cut surface: 5. Texture / Vesicularity: 6. Phenocrysts: 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: 10. Comment: why described as basalt if only pumice were recovered?							GNS?	no pic

SO255-DR154

Description of Location and Structure: Havre Trough, central profile. Elongated seamount structure, 9nm E of Coleville Ridge, S-flank of ridge

Dredge on bottom UTC 04/04/17 15:31hrs, lat 31 57.21'S, long 179 32,15'E, depth 2708m
Dredge off bottom UTC 04/04/17 16:38hrs, lat 31 56,92'S, long 179 32,14'E, depth 2384m
total volume: two rocks
Comments: one large somewhat altered pillow lava with cm thick Mn crust, plus one small lava piece ---> looks similar to the large Ol bearing pillow lava. All three pieces are slightly Ol phyric lava.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR154-1A	1. Rock Type: volcanic, basalt, altered, two pieces of the same pillow describes as 1A and 1B 2. Size: 43x37x27cm original size of block Z, two sample pieces A: 25x18x15cm; B: 23x16x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles ~25% up to 1.5cm 6. Phenocrysts: Ol <5% <2mm 7. Matrix: fine grained 8. Secondary Minerals: Iddingsite ~10% 3mm 9. Encrustations: 1cm Mn crust 10. Comment: failrly fresh Ol	x	x					GNS?	
SO255-DR154-1B	1. Rock Type: volcanic, basalt, altered, two pieces of the same pillow describes as 1A and 1B 2. Size: 43x37x27cm original size of block Z, two sample pieces A: 25x18x15cm; B: 23x16x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles ~20% up to 6mm, some filled with sediment 6. Phenocrysts: Ol ~5% <2mm up to 1cm; Px? 7. Matrix: fine grained 8. Secondary Minerals: Iddingsite ~10% <3mm 9. Encrustations: 1.3cm Mn crust, chilled margin 10. Comment: failrly fresh Ol; chilled margin should be checked for glass								
SO255-DR154-2	1. Rock Type: volcanic, basalt, altered 2. Size: 16x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey to brownish 5. Texture / Vesicularity: porphyric, vesicles 15-20% <2mm 6. Phenocrysts: Ol ~3% <1mm 7. Matrix: fine grained 8. Secondary Minerals: Iddingsite ~5% 2mm 9. Encrustations: 1.5cm Mn crust	x	x					GNS?	

SO255-DR155

Description of Location and Structure: Colville Ridge, central section. Slightly bended ridge like structure (tilted block?); northern part of the structure, steep SE flank, lower section

Dredge on bottom UTC 04/04/17 19:46hrs, lat 31 52.94'S, long 179 22,31'E, depth 2540m
Dredge off bottom UTC 04/04/17 20:52hrs, lat 31 52,68'S, long 179 22,22'E, depth 2120m
total volume: few rocks + biology
Comments: greenshist facies metamorphosed tuff? sediment? very fine grained lava?. A135

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR155-1	1. Rock Type: volcanic, very fine grained, tuff?, altered 2. Size: 30x25x23cm 3. Shape / Angularity: subangular 4. Color of cut surface: greyish green 5. Texture / Vesicularity: porphyric, few very small vesicles ~3% filled with secondary minerals / material 6. Phenocrysts: can't distinguish due to bad overall condition of rock, possibly Fsp-Px-Ol 7. Matrix: fine grained 8. Secondary Minerals: fillings of vesicles, filled cracks with CC 9. Encrustations: 3-5mm Mn crust 10. Comment: check TS for mineral content and phenocrysts, one portion showed possibly glass beneath Mn, check GL slab for fresh glass	x_air freight box	x					GNS	
SO255-DR155-2Mn	1. Rock Type: Mn crust from two different rocks, attached rock similar to -1 2. Size: 10x5x5cm rock + 2cm Mn crust, 11x5x4cm + 1.5-2cm Mn crust 3. Shape / Angularity: angular 4. Color of cut surface: brown 5. Texture / Vesicularity: layered Mn crust 6. Phenocrysts: can't distinguish due to bad overall condition of rock, possibly Fsp-Px-Ol 7. Matrix: fine grained 9. Encrustations: Mn crust 10. Comment: packed in soaked blue paper. How old is Mn crust? Age of green rock exposure?								

SO255-DR156

Description of Location and Structure: Colville Ridge, central section. Slightly bended ridge like structure (tilted block?); northern part of the structure, steep SE flank, mid section. 2nd track of a three track profile to sample entire slope from base to top

Dredge on bottom UTC 04/04/17 22:52hrs, lat 31 53.19'S, long 179 21,11'E, depth 2060m
Dredge off bottom UTC 05/04/17 00:52hrs, lat 31 53,08'S, long 179 21,03'E, depth 1860m
total volume: one rock
Comments: greenish volcaniclastic rock with occassional cm-sized lava fragments. All samples are part of a big block

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR156-1A	1. Rock Type: volcaniclastic, poorly sorted andesitic breccia 2. Size: 45x24x17 original size of block, sample piece 20x15x8cm sliced up to detect larger clasts 3. Shape / Angularity: subangular 4. Color of cut surface: green partly brownish 5. Texture / Vesicularity: many clasts, normally graded, clast ø from several mm up to 6cm, polymictic 6. Phenocrysts: largee lava clasts contain Fsp & Px up to 3mm 7. Matrix: matrix to clast supported 8. Secondary Minerals: chlorite altered, greenshist facies metamorphosed? 9. Encrustations: several mm of Mn coating 10. Comment: lithic fiame, andesitic breccia, four slices packed together, they contain two larger lava clasts up to 6cm. Another two slices packed together contain a single clast and several slices with matrix were also sampled							GNS	
SO255-DR156-1B	1. Rock Type: volcaniclastic, poorly sorted andesitic breccia 2. Size: 45x24x17 original size of block, sample piece 15x12x7cm sliced up to detect larger clasts 6. Phenocrysts: two larger lava clasts contain Fsp & Px up to 3mm 10. Comment: similar to sample -1A, size of big clasts up to 3cm, careful preparation & picking of clasts required							GNS	
SO255-DR156-1C	1. Rock Type: volcaniclastic, poorly sorted andesitic breccia 2. Size: 45x24x17 original size of block, sample piece 20x15x7cm total volume of three pieces 10. Comment: similar to sample -1A + B, three pieces to GNS, presence of larger cm-sized lava clast to be detected by slicing							GNS	

SO255-DR157

Description of Location and Structure: Colville Ridge, central section. 0.5 nm W of DR156 uppermost section of wall. S dipping slope upper 1/3.

Dredge on bottom UTC 05/04/17 02:08hrs, lat 31 52.80'S, long 179 20,50'E, depth 1360m
Dredge off bottom UTC 05/04/17 03:29hrs, lat 31 52,77'S, long 179 20,45'E, depth 1350m
total volume: few rocks
Comments: dredge got stuck near start. Poorly sorted greenish breccia

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR157-1	1. Rock Type: breccia, poorly sorted 2. Size: 8x8x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: olive green 5. Texture / Vesicularity: several brighter green clasts, polymictic; in the matrix a few mm sized orange clasts, one larger up to 1cm that may be useful for geochemistry 7. Matrix: clast supported 9. Encrustations: thin Mn coating 10. Comment: all samples of this dredge look alike, not possible decide on volcanic or sedimentary origin, bigger orange clast separated from matrix	x							
SO255-DR157-2	1. Rock Type: breccia, poorly sorted 2. Size: 9x8x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: greenish 5. Texture / Vesicularity: many clasts up to 1cm, fewer orange clasts, sub mm size 7. Matrix: clast supported 9. Encrustations: thin Mn coating 10. Comment: compared to -1 no larger clasts visible	x							
SO255-DR157-3	1. Rock Type: breccia, poorly sorted 2. Size: 10x9x7cm 7. Matrix: matrix supported 9. Encrustations: 3mm Mn coating 10. Comment: similar to -2, more affected by Mn, backup sample							back up	
SO255-DR157-4	1. Rock Type: breccia, poorly sorted 2. Size: 12x8x6cm 7. Matrix: clast supported 9. Encrustations: thin Mn coating 10. Comment: similar to -1 through -3 but no obvious larger clasts, entire sample fro GNS							GNS	

SO255-DR158

Description of Location and Structure: Colville Ridge, central section. Lowermost part of SE facing slope where deepest part of basin at the foot of the wall ends

Dredge on bottom UTC 05/04/17 05:42hrs, lat 31 54.76'S, long 179 19,84'E, depth 3390m
Dredge off bottom UTC 05/04/17 06:59hrs, lat 31 54,38'S, long 179 19,74'E, depth 2980m
total volume: few rock
Comments: slightly altered Plg-Px phyric andesites. -4 through -6 show more intense greenish discoloration.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR158-1	1. Rock Type: volcanic, lava, andesitic, slightly altered 2. Size: 12x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: relatively dense, 5% vesicles filled by secondary minerals 6. Phenocrysts: Plg 10% <1.5mm slightly altered; Px 5% <2mm slightly altered 7. Matrix: fine to medium grained 8. Secondary Minerals: yellow mineral fill in vesicles 9. Encrustations: <1 Mn crust, 0.5cm volcaniclastic material attached	x_air freight box	x						GNS	
SO255-DR158-2	1. Rock Type: volcanic, lava, andesitic, slightly altered, volcaniclastic material attached 2. Size: 18x13x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: slightly porphyric, dense, fractures filled by secondaries 6. Phenocrysts: Plg 5% <1mm 7. Matrix: fine grained 8. Secondary Minerals: in fractures 9. Encrustations: 1cm volcaniclastic material attached 10. Comment: -1 & -2 grouped to moderately altered, aphyric, dense lava unit	x_air freight box	x							
SO255-DR158-3	1. Rock Type: volcanic, lava, andesitic, altered 2. Size: 10x10x5cm 3. Shape / Angularity: angular 4. Color of cut surface: green 5. Texture / Vesicularity: rel. dense, some fractures, 1% vesicles 6. Phenocrysts: Plg 15% <3mm half of them altered yellow; Px? 5% <1mm; MT 3% <1mm 7. Matrix: fine grained 8. Secondary Minerals: yellow minerals = altered Plg? 9. Encrustations: <1mm Mn crust and volcaniclastics 10. Comment: grouped to porphyric, Chlorite altered Plg + Px phyric lava unit	x_air freight box	x						GNS	
SO255-DR158-4	1. Rock Type: volcanic, lava, andesitic, altered 2. Size: 11x5x4cm 3. Shape / Angularity: angular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: rel. dense, some fractures, 1% vesicles 6. Phenocrysts: Plg? 10% <2mm altered yellow; Px? 5% <1mm green altered 7. Matrix: fine grained 8. Secondary Minerals: yellow anf green minerals, not shiny / reflecting 9. Encrustations: <1mm Mn crust and volcaniclastics 10. Comment: grouped to porphyric, Chlorite altered Plg + Px phyric lava unit	x								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR158-5A	1. Rock Type: volcanic, lava, chlorite? altered, greenshist facies metamorphosed 2. Size: 19x15x11cm 3. Shape / Angularity: angular 4. Color of cut surface: green-grey-blueish 5. Texture / Vesicularity: porphyric 6. Phenocrysts: all altered 7. Matrix: fine grained 8. Secondary Minerals: chlorite filled veins, all Plg (3%) altered to yellowish mineral 9. Encrustations: 4mm Mn crust	x	x						
SO255-DR158-5B	1. Rock Type: volcanic, lava, chlorite? altered, greenshist facies metamorphosed 2. Size: 14x12x10cm 3. Shape / Angularity: sub-angular 4. Color of cut surface: green-blue-grey 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px 5%<1mm 7. Matrix: fine grained 8. Secondary Minerals: chlorite filled veins, all 5% Plg altered to yellowish mineral, milky - white clear mineral along veins 9. Encrustations: 4mm Mn crust							GNS	
SO255-DR158-5C	1. Rock Type: volcanic, lava, chlorite? altered, greenshist facies metamorphosed 2. Size: 15x13x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: green-blue-grey 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Plg 3% <2mm with alteration halos 7. Matrix: fine grained 8. Secondary Minerals: chlorite in veins 9. Encrustations: 1.1cm bright green Chl crust, 3mm Mn crust								
SO255-DR158-6	1. Rock Type: volcaniclastic, highly altered 2. Size: 11x13x6.5cm 3. Shape / Angularity: subangular 4. Color of cut surface: green - blue grey 5. Texture / Vesicularity: polymictic 7. Matrix: fine grained 8. Secondary Minerals: Chlorite 9. Encrustations: 4.4cm horizon of unsorted angular clasts in muddy matrix. Largest clast 1.1x0.4cm, 2mm crust 10. Comment: 0.8x0.4cm largest identifyable clast, low T alteration								
SO255-DR158-7X	1. Rock Type: volcaniclastic, 3 clasts in matrix, altered 2. Size: 8x8x3cm 3. Shape / Angularity: subangular 4. Color of cut surface: green - blue grey 5. Texture / Vesicularity: polymictic 6. Phenocrysts: largest clast contains Px? 7. Matrix: fine grained 8. Secondary Minerals: circular alteration halo, chlorite 9. Encrustations: largest clast 2.5x2cm								
SO255-DR158-8X	1. Rock Type: volcanic, lava, hightly altered 2. Size: 6x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: green blue grey 5. Texture / Vesicularity: 7% <1mm mostly filled with zeolites 6. Phenocrysts: Px? Ol strongly altered 7. Matrix: fine grained 8. Secondary Minerals: 5% zeolites, chlorite								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR158-9X	1. Rock Type: volcaniclastic, with 4x2.5cm clast 2. Size: 7x6x4.5cm 3. Shape / Angularity: angular 4. Color of cut surface: greenish grey 5. Texture / Vesicularity: clast supported 6. Phenocrysts: bigger clast contains 5% Px <1mm, 5-10% altered yellow Plg 7. Matrix: medium grained 9. Encrustations: 2mm Mn crust 10. Comment: back up sample								

SO255-DR159

Description of Location and Structure: Colville Ridge, central section. Bottom of 1km high scarp facing Havre Trough

Dredge on bottom UTC 05/04/17 09:54hrs, lat 31 57.73'S, long 179 15,43'E, depth 3439m

Dredge off bottom UTC 05/04/17 11:08hrs, lat 31 57,42'S, long 179 15,33'E, depth 3101m

total volume: few rocks

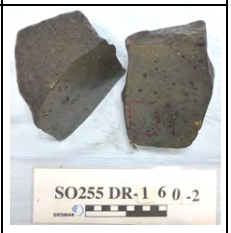
Comments: three pieces of solid rock, one lava with ok Px, one heavily altered (red-green) lava, one small piece of volcaniclastic and four white / beige sediments

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR159-1	1. Rock Type: volcanic, lava? 2. Size: 17x14x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: medium grey to light grey 5. Texture / Vesicularity: porphyric, dense, some fractures 6. Phenocrysts: Px ~10% <2mm; Fsp 15% <1mm; MT? ~10% <2mm. Some altered minerals brownish <4% <2mm, altered Px? 7. Matrix: fine to medium grained 9. Encrustations: <1mm Mn crust	x_air freight box	x					GNS	
SO255-DR159-2	1. Rock Type: volcanic, lava?, highly altered 2. Size: 19x18x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyric, vesicles 5% <4mm filled, some fractures 6. Phenocrysts: Fsp 5-10% <2mm; Px 5-10% <3mm 7. Matrix: fine grained 8. Secondary Minerals: fractures and vesicles filled with white material <5%, greenish ~5% <1mm (malachite) 9. Encrustations: <1mm Mn crust	x_air freight box						GNS	
SO255-DR159-3	1. Rock Type: volcaniclastic 2. Size: 16x12x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown to black 5. Texture / Vesicularity: unsorted clasts, vary <1mm up to 1.5cm 9. Encrustations: up to 4mm Mn crust								
SO255-DR159-4	1. Rock Type: sediment fresh 2. Size: 25x13x18cm 3. Shape / Angularity: subrounded 4. Color of cut surface: white to beige 5. Texture / Vesicularity: semi consolidated, well sorted some boreholes 7. Matrix: foram ooze 9. Encrustations: some Mn crust <1mm								

SO255-DR160

Description of Location and Structure: Havre Trough, NW margin of trough, c 26nm E of Colville Ridge. Ridge structure, upper flank above deep Havre Trough.

Dredge on bottom UTC 05/04/17 16:30hrs, lat 32 24.69'S, long 179 36,78'E, depth 3461m
Dredge off bottom UTC 05/04/17 17:22hrs, lat 32 24,46'S, long 179 36,74'E, depth 3068m
total volume: few rocks
Comments: few rounded pieces of lava, probably sheet flows, no glass. Px-Ol phyric lava throughout.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR160-1	1. Rock Type: volcanic, basalt, fresh minerals 2. Size: 23x17x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: black grey 5. Texture / Vesicularity: porphyric, vesicles 15% <7mm 6. Phenocrysts: Px ~7% <3mm; Ol 5% <7mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x	x					GNS	
SO255-DR160-2	1. Rock Type: volcanic, basalt, fresh minerals 2. Size: 29x14x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: 10% <1.5cm 6. Phenocrysts: Px ~4% <1mm; Ol 2% <1mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust	x	x					GNS	
SO255-DR160-3	1. Rock Type: volcanic, basalt 2. Size: 27x13x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% <1.1cm 6. Phenocrysts: Px ~5% <2mm; Ol 3% <2mm 7. Matrix: fine grained 9. Encrustations: 2mm Mn crust	x	x					GNS	
SO255-DR160-4	1. Rock Type: volcanic, basalt, fresh minerals 2. Size: 24x14x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey dark 5. Texture / Vesicularity: porphyric, vesicles 2% <8mm 6. Phenocrysts: Px <1% <1mm; Ol 7-10% <5mm 7. Matrix: fine grained 9. Encrustations: 3mm Mn crust 10. Comment: fairly altered	x	x					GNS	
SO255-DR160-5	1. Rock Type: volcanic, basalt 2. Size: 20x14x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 15-20% <7mm 6. Phenocrysts: Px ~7-10% <2mm; Ol 3% <3mm; Plg 3% <1mm 7. Matrix: fine grained 9. Encrustations: ~3mm Mn crust 10. Comment: alteration halo	x	x					GNS	
SO255-DR160-6	1. Rock Type: volcanic, basalt, pillow lava 2. Size: 11x10x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 25-30% ~1.5cm 6. Phenocrysts: Px ~7% <3mm; Ol 3% <1mm 7. Matrix: fine grained 9. Encrustations: ~1mm Mn crust 10. Comment: sediment filled vesicles, chilled margin	x	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR160-7	1. Rock Type: volcanic, basalt 2. Size: 12x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 6. Phenocrysts: Px ~15% <3mm; Ol 10% <1mm; Fsp ~7% <2mm, Px/Ol glomerocrysts 7. Matrix: fine grained 9. Encrustations: <5mm Mn crust 10. Comment: alteration halo, sediment infill of vesicles, chilled margin volcaniclastic layer between basalt and Mn crust	x	x					GNS	
SO255-DR160-8X	1. Rock Type: volcanic, basalt, pillow lava, fairly fresh 2. Size: 10x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles <6mm up to 15mm 6. Phenocrysts: Px ~10% <3mm; Ol 5% <2mm; Fsp ~2% <1mm 7. Matrix: fine grained 9. Encrustations: ~2mm Mn crust 10. Comment: chilled margin, filled vesicles, 6cm long fracture with alteration minerals								
SO255-DR160-9X	1. Rock Type: volcanic, basalt, fresh 2. Size: 13x10x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 20-25% 6. Phenocrysts: Px ~5% <2mm; Ol 5% <1mm; Fsp <1% <1mm 7. Matrix: fine grained 9. Encrustations: 2mm Mn crust, some sediment fillings								
SO255-DR160-10X	1. Rock Type: volcanic, basalt, fresh 2. Size: 10x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 10% <5mm 6. Phenocrysts: Px ~10% <2mm; Ol 5% <2mm 7. Matrix: fine grained 8. Secondary Minerals: some vesicles filled with brownish white matrial 9. Encrustations: <1mm Mn crust								
SO255-DR160-11X	1. Rock Type: volcanic, basalt 2. Size: 11x6x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 5% <1mm 6. Phenocrysts: Px ~5% <3mm; Ol 10% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust								
SO255-DR160-12X	1. Rock Type: volcanic, basalt 2. Size: 8x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, vesicles 5-10% <2mm 6. Phenocrysts: Px ~20% <2mm; Ol 10% <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh minerals								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR160-13X	1. Rock Type: volcanic, basalt 2. Size: 11x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, vesicles 3% <3mm 6. Phenocrysts: Px ~20% <2mm; Ol 10% <4mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Ol								
SO255-DR160-14X	1. Rock Type: volcanic, basalt 2. Size: 11x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, vesicles 15% <3mm 6. Phenocrysts: Px ~??% <1mm; Ol 5% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust								

SO255-DR161

Description of Location and Structure: Havre Trough, central profile, large NE-SW elongated seamount / ridge structure. SW of NW-SE strikink central basin. SE slope lower 2/3

Dredge on bottom UTC 05/04/17 21:41hrs, lat 32 49.23'S, long 179 40,17'E, depth 2610m
Dredge off bottom UTC 05/04/17 23:03hrs, lat 32 48,94'S, long 179 40,10'E, depth 2164m
total volume: few hard rocks
Comments: fairly aphyric fresh lava, some with chilled margin, some pieces of matrix supported breccia

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR161-1	1. Rock Type: volcanic, basalt, fresh aphyric group 2. Size: 12x11x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, moderately vesicular 35% <7mm, open few filled with sediment 6. Phenocrysts: Ol <1% <1mm; Fsp <1% <1mm 7. Matrix: fine grained 9. Encrustations: glassy rim 5mm, Mn crust ~5mm 10. Comment: aphyric group, glass rim cut off, all to GEOMAR	x	x		GL			GNS	
SO255-DR161-2	1. Rock Type: volcanic, basalt, fresh aphyric group 2. Size: 12x12x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, moderately vesicular 30% <10mm, open few filled with sediment / Mn 6. Phenocrysts: Ol <1% <1mm; Fsp <1% <1mm 7. Matrix: fine medium grained, Fsp in groundmass visible 9. Encrustations: thin Mn crust ~1mm 10. Comment: aphyric group, glass rim cut off, all to GEOMAR	x	x					GNS	
SO255-DR161-3	1. Rock Type: volcanic, basalt, fresh aphyric group 2. Size: 5x5x3cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric to slightly phyric, moderately vesicular 20% <4mm 6. Phenocrysts: Ol <1% <4mm; Fsp <1% <3mm 7. Matrix: fine grained 9. Encrustations: thin Mn crust, removed 10. Comment: sample with largest phenocrsts in the aphyric group	x	x		GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR161-4	1. Rock Type: volcanic, basalt, slightly phyric group 2. Size: 17x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly porphyric, moderately vesicular 20% <4mm, partly filled with sediment grey beige 6. Phenocrysts: Ol <1% <1mm; Fsp <2% <1mm; Px 2% <2mm 7. Matrix: fine grained 9. Encrustations: Mn crust<1.4cm 10. Comment: aphyric group, glass rim cut off, all to GEOMAR	x	x		GL			GNS	
SO255-DR161-5	1. Rock Type: volcanic, basalt, slightly phyric group 2. Size: 21x16x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly porphyric, moderately vesicular 20% <8mm, partly filled with sediment 6. Phenocrysts: Ol <1% <1mm; Fsp <1% <1mm; Px 3% <2mm 7. Matrix: fine grained 9. Encrustations: Mn crust <1.5cm 10. Comment: back up sample							back up, GNS	
SO255-DR161-6	1. Rock Type: volcaniclastic, with subangular 1-2 cm sized clasts, matrix supported 2. Size: 16x11x6m 3. Shape / Angularity: subrounded 4. Color of cut surface: brown grey 5. Texture / Vesicularity: brecciated, clasts are moderate vesicular 6. Phenocrysts: clasts are mostly aphyric, some contain few Ol, Fsp, Px 7. Matrix: brecciated fine grained 8. Secondary Minerals:brownish grains 9. Encrustations: Mn crust <1cm	x						GNS	

SO255-DR162

Description of Location and Structure: Havre Trough, central profile, NW boundary / step of basin, 3nm SW of DR147, SE faciing slope from base to top. Potentially samples older Havre crust.

Dredge on bottom UTC 06/04/17 02:18rs, lat 32 51.82'S, long 179 52,27'E, depth 4002m

Dredge off bottom UTC 06/04/17 03:44hrs, lat 32 51,40'S, long 179 52,06'E, depth 3469m

total volume: 1/2 full

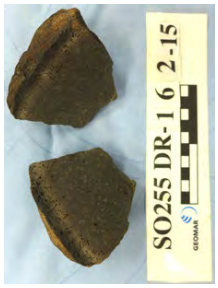
Comments: pillow lava, initially looked very uniform. After significant sawing three principle lithologies identified. 1) -1 to -6 Ol-Px phyric fresh no glass: 2) -7 to -15 Ol-Px phyric fresh with glass; 3) -16 to -22 aphyric to slightly Ol-Px phyric; 4) -23 & -24 aphyric with glass; 5) -25 & 26 highly Ol phyric microphenocryts <1mm dispersed in groundmass; 6) -27 & -28 more altered vesicle filled Ol basalt

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR162-1A	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group 2. Size: 37x22x22cm original size of block I, two pieces samples A:20x11x11cm (described here) and B:22x14x14cm (described below) 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 25% <5mm 6. Phenocrysts: Px 10-15% <7mm greenish; Ol ~8% <5mm; Plg is also described but not for 1B which is the same rock; so this is very likely a misidentification 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Ol; some fairly fresh Px	x	x						

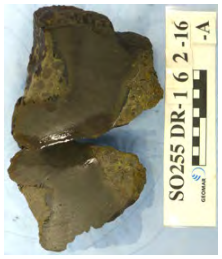
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR162-1B	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group 2. Size: 37x22x22cm original size of block I, two pieces samples A:20x11x11cm (described above) and B:22x14x14cm (described here) 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 2-3% <4mm, some fractures; piece A (from same block I described as having 25% vesicles) 6. Phenocrysts: Px 10% <5mm greenish mostly altered; Ol ~5% <3mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Ol, not clear if entire piece went to GNS							GNS	
SO255-DR162-2	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group 2. Size: 21x15x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 10% <2mm 6. Phenocrysts: Px 5% <4mm; Ol ~5% <4mm; Plg??? 5% <3mm also described, to be confirmed by TS 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Ol	x	x						
SO255-DR162-3	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group 2. Size: 17x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 10-15% <3mm, some fractures 6. Phenocrysts: Px 5-10% <5mm; Ol ~10% <5mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fresh Ol	x	x						
SO255-DR162-4	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group, ankaramitic 2. Size: 31x14x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 5% <5mm 6. Phenocrysts: Px 2-5% <3mm Cr-Diopside?; Ol ~3% <3mm 7. Matrix: fine grained groundmass 8. Secondary Minerals: some soft sediment vesicle fill, otherwise fresh 9. Encrustations: thin Mn crust 10. Comment: good rock for geochemistry; Ol should be checked if in equilibrium with melt	x	x					GNS	
SO255-DR162-5	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group, ankaramitic 2. Size: 21x16x13cm 3. Shape / Angularity: subangular to subrounded 4. Color of cut surface: dark grey, slight brown in vesicle 5. Texture / Vesicularity: porphyric, vesicles 5% up to 1cm but mainly <2mm 6. Phenocrysts: Px 2-3% <5mm; Ol ~3% <2mm, minerals well preserved 7. Matrix: fine grained groundmass 8. Secondary Minerals: some soft sediment vesicle infill 9. Encrustations: mm veneer of Mn crust								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR162-6	1. Rock Type: volcanic, dense basaltic lava, originally grouped with Ol-Px phyric group, to be confirmed by TS 2. Size: 16x10x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey to yellowish brown, altered phenocryts 5. Texture / Vesicularity: porphyric, dense and heavy 6. Phenocrysts: Px 3% ~1mm seems ok; Ol ~2% 2mm yellowish altered 7. Matrix: fine grained alterted groundmass 8. Secondary Minerals: iddingsite 9. Encrustations: mm thin Mn crust 10. Comment: careful prep. required for geochemistry; ok for HFSE?								
SO255-DR162-7	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group with glass rind, ankaramitic 2. Size: 17x12x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 2-3% <2mm 6. Phenocrysts: Px 4% <5mm; Ol ~3% 4mm fresh yellow shine forsteritic?; Fsp ~1% <4mm 7. Matrix: fine grained fresh groundmass 8. Secondary Minerals: some slight brownish stain in vesicles 9. Encrustations: sub mm Mn oxide; 5mm glass rind with Ol/Px --> suitable for instant melt inclusion work and melt mineral equilibrium work	x	x		GL			GNS	
SO255-DR162-8	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group with glass rind 2. Size: 12x12x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, vesicles 20% <5mm 6. Phenocrysts: Px none described but likely present; Ol ~3% 4mm fresh yellowish; Plg ~3% <2mm 7. Matrix: fine grained 9. Encrustations: thin glass rind 10. Comment: fresh Ol	x	x		GL				
SO255-DR162-9	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group with glass rind 2. Size: 17x11x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: medium grey 5. Texture / Vesicularity: porphyric, vesicles ~10% <4mm 6. Phenocrysts: Px ~3% <3mm; Ol ~5% <2mm yellowish; Plg ~3% <2mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with brownish material (lava?) 9. Encrustations: 2mm glass rim; 1mm Mn crust; chilled margin 10. Comment: fresh Ol	x	x		GL				
SO255-DR162-10	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group with glass rind 2. Size: 14x14x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 15-20% <6mm; some cracks 6. Phenocrysts: Px 5% <1mm; Ol ~10% <3mm yellowish 7. Matrix: fine grained 9. Encrustations: chilled margin with 2mm glass rim; <1mm Mn crust; 10. Comment: fresh Ol	x	x		GL			GNS	

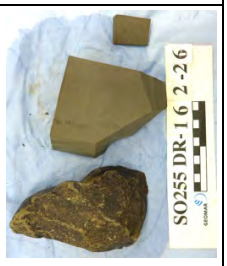
Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR162-11	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group with glass rind 2. Size: 10x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles ~10% <3mm 6. Phenocrysts: Px ~5% <2mm; Ol ~5% <2mm 7. Matrix: fine grained 8. Secondary Minerals: some vesicle filled with lava? 9. Encrustations: chilled margin with 2mm glass rim; <1mm Mn crust; 10. Comment: fresh Ol				GL				
SO255-DR162-12	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group with glass rind 2. Size: 11x11x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 5-10% 6. Phenocrysts: Px ~5% <1mm; Ol ~5% <1mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with lava? 9. Encrustations: chilled margin with 2mm glass rim; 1mm Mn crust								
SO255-DR162-13	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group with glass rind 2. Size: 12x11x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 15-20% <3mm 6. Phenocrysts: Px ~5% <1mm; Ol ~10% <3mm 7. Matrix: fine grained 8. Secondary Minerals: some vesicles filled with lava? 9. Encrustations: chilled margin with 2mm glass rim 10. Comment: fresh Ol								
SO255-DR162-14	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group with glass rind 2. Size: 16x10x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 6. Phenocrysts: Px <5% <1mm; Ol ~5% <2mm yellowish 7. Matrix: fine grained 9. Encrustations: chilled margin with ~3mm glass rim; 1mm Mn crust 10. Comment: fresh Ol								
SO255-DR162-15	1. Rock Type: volcanic, basalt, fresh, Ol-Px phyric group with glass rind 2. Size: 11x8x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 5-10% <2mm 6. Phenocrysts: Px ~5% <2mm; Ol ~5% <4mm yellowish 7. Matrix: fine grained 8. Secondary Minerals: some vesicles filled with lava? 9. Encrustations: chilled margin with 4mm glass rim; 1mm Mn crust 10. Comment: fairly fresh Ol								

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR162-16A	1. Rock Type: volcanic, with attached volcaniclastic material, basalt, fresh, aphyric to slightly Ol-Px phyric group 2. Size: 27x25x21cm original size of block H, sample piece A: 13x13x11cm (described here) and sample piece B: 20x11x11cm described below 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: slightly porphyric, chilled margin, dense 6. Phenocrysts: Px ~10% <1.5mm; Ol ~8% <1mm yellowish 7. Matrix: fine grained, aphyric 9. Encrustations: 0.5mm chilled margin around volcaniclastic material, intra-pillow hyaloclastite?								
SO255-DR162-16B	1. Rock Type: volcanic, with attached volcaniclastic material, basalt, fresh, aphyric to slightly Ol-Px phyric group 2. Size: 27x25x21cm original size of block H, sample piece A: 13x13x11cm (described above and sample piece B: 20x11x11cm (described here) 3. Shape / Angularity: angular 4. Color of cut surface: grey to dark grey 5. Texture / Vesicularity: slightly phyric, fairly dense <3% vesicles 6. Phenocrysts: Px ~10% <1mm; Ol ~10% <1mm 7. Matrix: fine grained, aphyric 10. Comment: similar to -1A	x	x					GNS	
SO255-DR162-17	1. Rock Type: volcanic, basalt, fresh, aphyric to slightly Ol-Px phyric group 2. Size: 12x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: relatively aphyric, 20% vesicles 6. Phenocrysts: Px 2% <1mm; Ol ~3% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR162-18	1. Rock Type: volcanic, basalt, fresh, aphyric to slightly Ol-Px phyric group 2. Size: 19x17x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: more phyric than other sample in this group, 3% vesicles 6. Phenocrysts: Px 3% <1mm; Ol ~10% <2mm; Plg <1% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR162-19	1. Rock Type: volcanic, basalt, fresh, aphyric to slightly Ol-Px phyric group 2. Size: 16x13x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: nearly aphyric,, quite dense 3% vesicles <5mm 6. Phenocrysts: Px 2-3% <1mm; Ol ~5% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR162-20	1. Rock Type: volcanic, basalt, fresh, aphyric to slightly Ol-Px phyric group 2. Size: 13x13x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: slightly phyric, 20% vesicles <5mm, some fractures with alteration 6. Phenocrysts: Px 5% <1mm; Ol ~5% <2mm; Plg? 2% <1mm 7. Matrix: fine grained 8. Secondary Minerals: fractures filled with white to brownish material 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR162-21	1. Rock Type: volcanic, basalt, fresh, aphyric to slightly Ol-Px phyric group 2. Size: 18x18x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric to nearly aphyric, 15-20% vesicles <5mm 6. Phenocrysts: Px 5% <1mm; Ol 5-10% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust								
SO255-DR162-22	1. Rock Type: volcanic, basalt, fresh, aphyric to slightly Ol-Px phyric group 2. Size: 21x17x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, 15-20% vesicles <3mm 6. Phenocrysts: Px 5% <1mm; Ol ~10% <1mm yellowish 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR162-23	1. Rock Type: volcanic, basalt, fresh, aphyric to slightly Ol-Px phyric group with glass 2. Size: 13x13x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: slightly phyric, 20% vesicles, decrease in abundance from core to margin / glass rim 6. Phenocrysts: Px 3% <1mm; Ol ~5% <1mm single grain max 3mm 7. Matrix: fine grained 9. Encrustations: 5mm glass crust	x	x		GL				
SO255-DR162-24	1. Rock Type: volcanic, basalt, fresh, aphyric to slightly Ol-Px phyric group with glass 2. Size: 15x15x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: slightly phyric, 15% vesicles 6. Phenocrysts: Px 4% <1mm; Ol ~8% <2mm 7. Matrix: fine grained 9. Encrustations: 5mm glass crust 10. Comment: similar to -23				GL			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR162-25	1. Rock Type: volcanic, basalt, fresh, with abundant Ol microphenocrysts <1.5mm, assigned seperate Ol phyric group with minor Px 2. Size: 22x16x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: sligtly phyric, 15-20% vesicles <3mm 6. Phenocrysts: Px 1% <0.5mm; Ol ~8% <1.5mm yellowish 7. Matrix: fine grained to medium grained 10. Comment: initial description after sawing recalls abundant, evenly distributed small fresh Ol crystals; this is potentially a very mafic rock	x	x						
SO255-DR162-26	1. Rock Type: volcanic, basalt, fresh, aphyric 2. Size: 15x15x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark greenish grey 5. Texture / Vesicularity: aphyric, dense, linear fractures from degassing? 6. Phenocrysts: aphyric, no crystals visible 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust	x	x					GNS	
SO255-DR162-27	1. Rock Type: volcanic, basalt, slightly altered, grouped into potentially older unit due to more alteration and vesicle filling fresh 2. Size: 13x13x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles ~10% <4mm 6. Phenocrysts: Ol ~5% <2mm yellowish 7. Matrix: fine grained 8. Secondary Minerals: vesicle at outer margin filled with sediment 9. Encrustations: <1mm Mn crust	x	x						
SO255-DR162-28	1. Rock Type: volcanic, basalt, slightly altered, grouped into potentially older unit due to more alteration and vesicle filling fresh 2. Size: 17x14x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: nearly aphyric, vesicles ~10% <5mm 6. Phenocrysts: Ol 10-15% <1mm yellowish 7. Matrix: fine grained 8. Secondary Minerals: vesicle filled with sediment along margin 9. Encrustations: <1mm Mn crust								

SO255-DR163

Description of Location and Structure: Havre Trough, central profile, 8nm SW of DR162, NE-SE striking seamount, cut by fault with similar strike than overall structure, SE facing slope at SW end of seamount

Dredge on bottom UTC 06/04/17 07:05rs, lat 32 58.84'S, long 179 47,75'E, depth 3390m
Dredge off bottom UTC 06/04/17 08:14hrs, lat 32 58,54'S, long 179 47,62'E, depth 2897m
total volume: empty

SO255-DR164

Description of Location and Structure: Havre Trough near Kuiwai Volcano, circular cone on plateau - like structure, S-flank

Dredge on bottom UTC 06/04/17 11:06hrs, lat 33 7.18'S, long 179 41,15'E, depth 1907m
Dredge off bottom UTC 05/04/17 12:16hrs, lat 33 7,56'S, long 179 41,15'E, depth 1561m
total volume: full
Comments: full dredge with many large pillows with some Mn coating, all cut samples (>20) were the same Fsp-Px-Ol phyric lava. Ten representative samples plus one volcaniclastic breccia taken

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR164-1	1. Rock Type: volcanic, basalt 2. Size: 27x23x20cm original size of block P, sample piece 17x14x18cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, vesicles 15-20% <4mm 6. Phenocrysts: Plg 15% <5mm; Ol ~5% <2mm; Px 5% <2mm 7. Matrix: fine grained 9. Encrustations: chilled margin <2cm with glass rim 10. Comment: fresh minerals	x	x		GL			GNS	
SO255-DR164-2A	1. Rock Type: volcanic, basalt 2. Size: 32x27x25cm original size of block C, sample pieces A: 18x14x7cm and B: 19x15x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 25-30% <2mm 6. Phenocrysts: Plg 10% <2mm; Ol 3% <1mm; Px 5% <2mm 7. Matrix: fine grained 9. Encrustations: glass rim <4mm and Mn crust <1mm 10. Comment: fresh minerals	x	x		GL			GNS	
SO255-DR164-2B	1. Rock Type: volcanic, basalt 2. Size: 32x27x25cm original size of block C, sample pieces A: 18x14x7cm and B: 19x15x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 30% <6mm 6. Phenocrysts: Plg 10% <3mm; Ol 2% <2mm; Px 7% <2mm 7. Matrix: fine grained 9. Encrustations: glass rim <3mm and Mn crust <1mm 10. Comment: fresh minerals								
SO255-DR164-3A	1. Rock Type: volcanic, basalt 2. Size: 40x32x25cm original size of block Q, sample piece A: 14x12x8cm, sample piece B: 22x20x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20% <3mm 6. Phenocrysts: Plg 10% <3mm; Ol ~1% <1mm; Px 7% <2mm 7. Matrix: fine grained 9. Encrustations: glass rim <7mm, Mn crust <1mm 10. Comment: fresh minerals	x	x					GNS	
SO255-DR164-3B	1. Rock Type: volcanic, basalt 2. Size: 40x32x25cm original size of block Q, sample piece A: 14x12x8cm, sample piece B: 22x20x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 20% <2mm 6. Phenocrysts: Plg 15% <3mm; Ol ~1% <1mm; Px 7% <1mm 7. Matrix: fine grained 9. Encrustations: glass rim <6mm, Mn crust <1mm 10. Comment: fresh minerals	x	x		GL				

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR164-4	1. Rock Type: volcanic, basalt 2. Size: 20x20x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 25-30% <2mm 6. Phenocrysts: Plg 7% <3mm; Ol 3% <2mm; Px 10% <1mm 7. Matrix: fine grained 9. Encrustations: Mn crust <1mm 10. Comment: fresh minerals	x	x						
SO255-DR164-5	1. Rock Type: volcanic, basalt 2. Size: 17x15x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 30% <7mm 6. Phenocrysts: Plg 5% <3mm; Ol ~2% <2mm; Px 1% <1mm 7. Matrix: fine grained 9. Encrustations: 3mm glass rim 10. Comment: fresh minerals	x	x		GL			GNS	
SO255-DR164-6	1. Rock Type: volcanic, basalt 2. Size: 19x17x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 30% <3mm 6. Phenocrysts: Plg 10% <3mm; Ol ~3% <2mm; Px 10% <3mm 7. Matrix: fine grained 9. Encrustations: <6mm glass rim, <1mm Mn crust 10. Comment: fresh minerals	x	x		GL				
SO255-DR164-7A	1. Rock Type: volcanic, basalt 2. Size: 31x25x22cm original size of block H, sample piece A: 22x20x13cm, sample piece B: 19x13x12 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 30% <2mm 6. Phenocrysts: Plg 7% <5mm; Ol ~2% <2mm 7. Matrix: fine grained 9. Encrustations: 3mm glass rim 10. Comment: fresh minerals	x	x		GL			GNS	
SO255-DR164-7B	1. Rock Type: volcanic, basalt 2. Size: 31x25x22cm original size of block H, sample piece A: 22x20x13cm, sample piece B: 19x13x12 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 30% <7mm 6. Phenocrysts: Plg 7% <6mm; Ol 1% <2mm 7. Matrix: fine grained 9. Encrustations: 3mm glass rim 10. Comment: fresh minerals								
SO255-DR164-8	1. Rock Type: volcanic, basalt 2. Size: 14x9x20cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% <4mm 6. Phenocrysts: Plg 3% <4mm; Ol ~3% <2mm 7. Matrix: fine grained 9. Encrustations: 3mm glass rim 10. Comment: fresh minerals								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR164-9	1. Rock Type: volcanic, basalt 2. Size: 19x11x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 20% <4mm 6. Phenocrysts: Plg 7% <4mm; Ol 2% <3mm 7. Matrix: fine grained 10. Comment: fresh minerals	x	x						
SO255-DR164-10	1. Rock Type: volcanic, basalt 2. Size: 20x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 30% <3mm 6. Phenocrysts: Plg 10% <4mm; Ol ~1% <2mm 7. Matrix: fine grained 9. Encrustations: 2mm glass rim 10. Comment: fresh minerals	x	x		GL				
SO255-DR164-11	1. Rock Type: volcaniclastic 2. Size: 27x22x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: black grey 5. Texture / Vesicularity: monomictic 6. Phenocrysts: clasts contain Px, Ol, Fsp 7. Matrix: medium grained 40% matrix 10. Comment: largest clast 1.8x1.5cm clasts are basaltic lava, fresh minerals								

SO255-DR165

Description of Location and Structure: Volcanic Front, Kuiwai Volcano, large cone on W-flank, S-facing slope

Dredge on bottom UTC 06/04/17 15:05hrs, lat 33 9.48'S, long 179 59,32'E, depth 1407m
Dredge off bottom UTC 06/04/17 16:01hrs, lat 33 9,79'S, long 179 59,21'E, depth 1162m
total volume: 1/5 full
Comments: fresh Ol-Px and Fsp bearing lava ---> glassy, glass rinds full of Ol & Px

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR165-1	1. Rock Type: volcanic, basalt, fresh, Ol-Px basalt group 2. Size: 21x21x14cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% <5mm 6. Phenocrysts: Ol 15% <7mm; Px ~5% <1.2mm; Fsp 5% <3mm 7. Matrix: fine grained 9. Encrustations: 8mm glass rim with large fresh Ol & Px 10. Comment: fresh minerals	x	x		GL			GNS	
SO255-DR165-2	1. Rock Type: volcanic, basalt, fresh, Ol-Px basalt group 2. Size: 15x11x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% <10mm 6. Phenocrysts: Ol 10% <6mm; Px ~10% <9mm; Fsp 5% <3mm 7. Matrix: fine grained 9. Encrustations: 1.5cm glass rim with large fresh Ol & Px 10. Comment: fresh minerals	x	x		GL			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR165-3	1. Rock Type: volcanic, basalt, very fresh with Px and large Ol grains, Ol-Px basalt group 2. Size: 13x8x8cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: strongly porphyric, vesicles 10% 6. Phenocrysts: Ol 10% <6mm; Px ~10% <5mm 7. Matrix: fine grained 9. Encrustations: 8mm glass rim with large fresh Ol & Px 10. Comment: Px + Ol (very large)	x	x						
SO255-DR165-4	1. Rock Type: volcanic, basalt, fresh, Ol-Px basalt group 2. Size: 10x8x8cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 7% <5mm 6. Phenocrysts: Ol 5% <3mm; Px ~7% <5mm; Fsp 2% <2mm 7. Matrix: fine grained 9. Encrustations: 8mm glass rim with fresh Ol & Px 10. Comment: fresh minerals				GL			GNS	
SO255-DR165-5	1. Rock Type: volcanic, basalt, fresh, Ol-Px basalt group 2. Size: 13x10x6cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey to black 5. Texture / Vesicularity: strongly porphyric, vesicles 10% <10mm 6. Phenocrysts: Ol 15% <3mm; Px ~15% <6mm; Fsp 3% <2mm 7. Matrix: fine grained 9. Encrustations: 5mm light grey chilled margin 10. Comment: Ol-Px basalt group								
SO255-DR165-6	1. Rock Type: volcanic, basalt, fresh, Ol-Px-Fsp basalt group 2. Size: 22x17x14cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 7% <8mm 6. Phenocrysts: Fsp 10% <4mm; Ol 3% <7mm; Px 3% <7mm 7. Matrix: fine grained 9. Encrustations: 3mm glass rim 10. Comment: fresh minerals	x	x						
SO255-DR165-7	1. Rock Type: volcanic, basalt, fresh, Ol-Px-Fsp basalt group 2. Size: 22x17x15cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 7% <8mm 6. Phenocrysts: Fsp 10% <3mm; Ol 6% <4mm; Px 5% <7mm 7. Matrix: fine grained 9. Encrustations: 4mm glass rim with Ol 10. Comment: fresh minerals	x	x					GNS	
SO255-DR165-8	1. Rock Type: volcanic, basalt, fresh, Ol-Px-Fsp basalt group 2. Size: 22x17x14cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% <8mm 6. Phenocrysts: Fsp 10% <3mm; Ol 5% <7mm; Px 3% <3mm 7. Matrix: fine grained 9. Encrustations: 3mm glass rim 10. Comment: fresh minerals	x	x		GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR165-9	1. Rock Type: volcanic, basalt, fresh, Ol-Px-Fsp basalt group 2. Size: 21x20x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey to black 5. Texture / Vesicularity: porphyric, vesicles 5% <5mm 6. Phenocrysts: Fsp 10% <2mm; Ol 3% <2mm; Px 7% <3mm 7. Matrix: fine grained 9. Encrustations: <3mm glass rim				GL			GNS	
SO255-DR165-10	1. Rock Type: volcanic, basalt, fresh, Ol-Px-Fsp basalt group 2. Size: 16x16x12cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10%, cooling fractures 6. Phenocrysts: Fsp 5% <2mm; Ol 3% <4mm; Px 8% <2mm 7. Matrix: fine grained 9. Encrustations: 3mm glass rim 10. Comment: fresh minerals								
SO255-DR165-11	1. Rock Type: volcanic, basalt, fresh, glassy, Ol-Px-Fsp basalt group 2. Size: 19x15x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: black to dark grey 5. Texture / Vesicularity: porphyric, vesicles 10% <4mm, fractures 6. Phenocrysts: Fsp 20% <2mm; Ol 5% <3mm; Px 7% <2mm 7. Matrix: fine grained 9. Encrustations: <3mm glass rim	x	x						
SO255-DR165-12	1. Rock Type: volcanic, basalt, fresh, glassy, Ol-Px-Fsp basalt group 2. Size: 17x13x7cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15%, cooling fractures 6. Phenocrysts: Fsp 2% <1mm; Ol 3% <3mm; Px 10% <3mm 7. Matrix: fine grained								
SO255-DR165-13	1. Rock Type: volcanic, basalt, fresh, Ol-Px-Fsp basalt group 2. Size: 19x17x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 10% <5mm 6. Phenocrysts: Fsp 7% <3mm; Ol 4% <2mm; Px 5% <4mm 7. Matrix: fine grained 9. Encrustations: 3mm glass rim 10. Comment: fresh minerals	x	x						
SO255-DR165-14	1. Rock Type: volcanic, basalt, fresh, glassy Ol-Px-Fsp basalt group 2. Size: 8x8x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, vesicles 15% 6. Phenocrysts: Fsp 2% <1mm; Ol 3% <2mm; Px 10% <1mm 7. Matrix: fine grained								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR165-15	1. Rock Type: volcanic, basalt, fresh, glassy Ol-Px-basalt group 2. Size: 27x20x15cm, uncut display sample for GNS 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: very porphyric, vesicles 20%. ropy lava 6. Phenocrysts: no cutting, similar to -1, max 7mm Px and Ol 7. Matrix: fine grained 9. Encrustations: 1cm fresh glass rind							GNS	
SO255-DR165-16	1. Rock Type: volcanic, basalt, fresh, glassy Ol-Px-basalt group 2. Size: 20x16x6cm, uncut display sample 3. Shape / Angularity: angular, plane 4. Color of cut surface: black 5. Texture / Vesicularity: very porphyric, vesicles 20% 6. Phenocrysts: no cutting, similar to -1, max 5mm Px and Ol 7. Matrix: fine grained 9. Encrustations: 5mm fresh glass rind 10. Comment: display sample							display	

SO255-DR166

Description of Location and Structure: Volcanic Front Kuiwai Volcano, SE flank of seamount, lower section, 16nm W of Kermadec Ridge.

Dredge on bottom UTC 06/04/17 17:48hrs, lat 33 7.77'S, long 179 57,33'E, depth 1736m

Dredge off bottom UTC 06/04/17 18:45hrs, lat 33 8,06'S, long 179 57,43'E, depth 1457m

total volume: full

Comments: various pillow lava fragments. Basically two groups identified 1) more Px-Ol phyric goup with fresh glassy margins; 2) aphyric some dense with and without glass

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR166-1	1. Rock Type: volcanic, basalt, fresh, slightly Ol-Px phyric basalt group, glass with phenocrysts 2. Size: 18x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: black (wet) 5. Texture / Vesicularity: slightly phyric, vesicles 30-40% max 14mm Avrg 2mm 6. Phenocrysts: Px 7% <5mm fresh green; Ol 3% <4mm fresh 7. Matrix: fine grained 9. Encrustations: glassy rim 10. Comment: lots of cracks	x	x		GL			GNS	
SO255-DR166-2	1. Rock Type: volcanic, basalt, fresh, slightly Ol-Px phyric basalt group, glass with phenocrysts 2. Size: 20x19x15cm 3. Shape / Angularity: angular 4. Color of cut surface: black (wet) 5. Texture / Vesicularity: slightly phyric, vesicles 40% <4mm, veins 6. Phenocrysts: Px 5% <3mm fresh; Ol 2% <3mm fresh 7. Matrix: fine grained 9. Encrustations: glassy rim	x	x		GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR166-3	1. Rock Type: volcanic, basalt, fresh, slightly Ol-Px phyric basalt group, glass with phenocrysts 2. Size: 17x17x11cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly phyric, vesicles 30-40% max 10mm Avrg 1mm 6. Phenocrysts: Px 5% <5mm fresh green; Ol 2% <2mm fresh 7. Matrix: fine grained 9. Encrustations: glassy rim	x	x		GL				
SO255-DR166-4	1. Rock Type: volcanic, basalt, fresh, slightly Ol-Px phyric basalt group, glass with phenocrysts 2. Size: 18x16x12cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly phyric, vesicles 30%, ~1mm 20%, <15mm 10% 6. Phenocrysts: Px 7% <4mm fresh green; Ol 5% <2mm fresh 7. Matrix: fine grained 9. Encrustations: glassy rim	x	x		GL			GNS	
SO255-DR166-5	1. Rock Type: volcanic, basalt, fresh, aphyric basalt group, sometimes with glassy rim 2. Size: 20x20x19cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, strongly vesiclar 30%, ~1mm 20%, <15mm 10% 6. Phenocrysts: very few Ol <1% <2mm fresh; Px 1% <2mm 7. Matrix: fine grained 9. Encrustations: glassy rim	x	x		GL				
SO255-DR166-6	1. Rock Type: volcanic, basalt, fresh, aphyric basalt group, sometimes with glassy rim 2. Size: 18x16x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, strongly vesiclar 40%, <6mm 20%, open 6. Phenocrysts: very few Ol <1% <5mm fresh 7. Matrix: fine grained 9. Encrustations: glassy rim 5mm	x	x		GL				
SO255-DR166-7	1. Rock Type: volcanic, basalt, fresh, aphyric basalt group, sometimes with glassy rim 2. Size: 23x22x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, strongly vesiclar 40%, <5mm 20%, open 6. Phenocrysts: very few Ol <1% <1mm fresh; Px 3% <2mm 7. Matrix: fine grained 9. Encrustations: glassy rim 4mm								
SO255-DR166-8	1. Rock Type: volcanic, basalt, fresh, aphyric basalt group, no glass 2. Size: 21x16x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, moderate vesiclar 25%, <4mm 20% open 6. Phenocrysts: very few Ol <2% <2mm 7. Matrix: fine grained	x	x		GL			GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR166-9	1. Rock Type: volcanic, basalt, fresh, aphyric basalt group, no glass 2. Size: 34x33x22cm block T 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, strongly vesiclar 40%, <5mm 6. Phenocrysts: very few Ol <1% <1mm 7. Matrix: fine grained	x	x					GNS	
SO255-DR166-10	1. Rock Type: volcanic, basalt, fresh, aphyric basalt group, no glass 2. Size: 38x23x20cm block J 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, strongly vesiclar 45%, <9mm 20% 6. Phenocrysts: very few Ol <1% <1mm fresh; Px 1% <3mm 7. Matrix: fine grained	x	x		GL			GNS	
SO255-DR166-11	1. Rock Type: volcanic, basalt, fresh, aphyric basalt group, no glass 2. Size: 11x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, moderate vesiclar 15%, ~2mm 6. Phenocrysts: very few Ol <<1% <1mm fresh 7. Matrix: fine grained, dense 9. Encrustations: glassy rim 10. Comment: less vesicular and more dense than other samples from dredge	x	x						
SO255-DR166-12	1. Rock Type: volcanic, basalt, fresh, back up samples 2. Size: 14x12x10cm, 13x11x9cm, 14x10x7cm, 13x10x7cm, 14x12x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric to slightly phyric 10. Comment: five back up samples with glassy rim							back up	

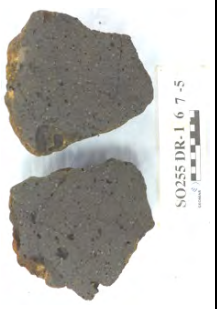
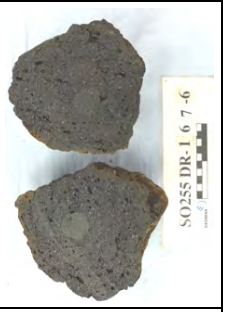
SO255-DR167

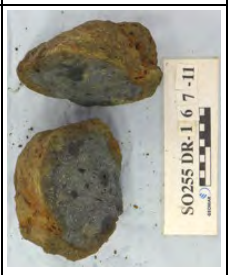
Description of Location and Structure: Volcanic Front Kuiwai Volcano, summit

Dredge on bottom UTC 06/04/17 20:17hrs, lat 33 9.24'S, long 179 57,34'E, depth 793m
Dredge off bottom UTC 06/04/17 21:14hrs, lat 33 9,52'S, long 179 57,44'E, depth 555m
total volume: 3/4 full
Comments: Two lithological groups identified 1) lava and 2) hydrothermal material. The lava group is subdivided into A) Plg+Px phyric, vesicular lava with occassional glassy margins (-1 through -6) and B) more dense a bit less Plg+Px phyric group (-7 through -9). The hydrothermal group (-10 through -21) consists of variably altered / mineralized lava fragments, hydrothermal sediments and mineralizations that includes a large baryte growing on a lava fragment (-18).

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR167-1	1. Rock Type: volcanic, basalt, fresh, Plg-Px phyric group, with glass 2. Size: 19x18x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10% open up to 1cm 6. Phenocrysts: Plg 15% up to 4mm fresh; Px <5% up to 3mm fresh 7. Matrix: fine grained, small Plg? needled in groundmass 8. Secondary Minerals: Mn and sediement filling in cracks 9. Encrustations: thin coating, glassy margin 10. Comment: -1 to -6 belong to highly Plg-Px phyric lava group. Only from -1 a glass slab has been cut off	x	x	2	GL			GNS	
SO255-DR167-2	1. Rock Type: volcanic, basalt, fresh, Plg-Px phyric group, with glass 2. Size: 22x13x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 15% open up to 1cm 6. Phenocrysts: Plg 10-15% up to 3mm fresh; Px 5% up to 5mm 7. Matrix: fine grained 10. Comment: contains a bit more Px and also a bit bigger crystals than -1	x	x	2				GNS	
SO255-DR167-3	1. Rock Type: volcanic, basalt, fresh, Plg-Px phyric group, with glass 2. Size: 23x18x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10% open up to 2cm 6. Phenocrysts: Plg 15% up to 5mm fresh; Px 7% up to 5mm fresh 7. Matrix: fine grained	x	x					GNS	
SO255-DR167-4	1. Rock Type: volcanic, basalt, fresh, Plg-Px phyric group, with glass 2. Size: 14x12x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 15% open up to 1cm 6. Phenocrysts: Plg 10% up to 3mm fresh; Px 10% up to 5mm fresh 7. Matrix: fine grained 10. Comment: fairly big Px compared to prev. DR167 samples	x	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR167-5	1. Rock Type: volcanic, basalt, fresh, Plg-Px phyric group 2. Size: 17x14x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 15% <8mm 6. Phenocrysts: Plg 15% up to 3mm fresh; Px <10% <7mm fresh 7. Matrix: fine grained 10. Comment: back up sample							back up	
SO255-DR167-6	1. Rock Type: volcanic, basalt, fresh, Plg-Px phyric group 2. Size: 16x14x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 15% <12mm, open, pipe like 6. Phenocrysts: Plg 15% <3mm fresh; Px <10% <5mm fresh 7. Matrix: fine grained 10. Comment: bread crust like fractures							back up	
SO255-DR167-7	1. Rock Type: volcanic, basalt, fresh, Plg-Px phyric group less vesicular more dense 2. Size: 20x16x13cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 15% <5mm, open 6. Phenocrysts: Plg 15% <4mm fresh; Px <15% <5mm fresh, sulfide mineral grains 7. Matrix: fine grained 10. Comment: tiny sulfide mineral grains? within vesicle <<1mm, but no grains visible	x	x					GNS	
SO255-DR167-8	1. Rock Type: volcanic, basalt, fresh, Plg-Px phyric group less vesicular more dense 2. Size: 24x19x15cm original size of block M, sample pieces 16x14x11cm and 12x13x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicles 10% <5mm, open, pipe like, compressed parallel to flow texture 6. Phenocrysts: Plg 15% <4mm fresh; Px <5% <5mm fresh, few sulfide mineral grains (silver) <1mm 7. Matrix: fine grained, flow texture mirrored by vesicle distribution in layers	x	x						
SO255-DR167-9	1. Rock Type: volcanic, basalt, fresh, Plg-Px phyric group less vesicular more dense 2. Size: 24x18x16cm original size of block K, sample pieces 22x13x12cm and 12x10x10cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, very small vesicles sub mm open 6. Phenocrysts: Plg 7% up to 5mm, mineral grains have a black outer part maybe intergrown with Px 7. Matrix: fine grained, fine Plg? needles in groundmass 8. Secondary Minerals: thin Mn coating 10. Comment: most dense sample of the lava group	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR167-10	1. Rock Type: volcanic, basalt, hydrothermally altered, hydrothermal group 2. Size: 24x14x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric, vesicles 10% up to 1cm filled with sulfide minerals 6. Phenocrysts: minerals hydrothermally altered 7. Matrix: fine grained 8. Secondary Minerals: altered and filled cracks 9. Encrustations: thin coating 10. Comment: sample -10 through-21 are grouped into hydrothermal unit							GNS	
SO255-DR167-11	1. Rock Type: volcanic, basalt, hydrothermally altered, hydrothermal group 2. Size: 17x14x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to greenish 5. Texture / Vesicularity: porphyric, vesicles 5% up to 1cm mostly filled 6. Phenocrysts: Plg 10% up to 3mm altered; Px 5% up to 3mm altered 7. Matrix: fine grained 8. Secondary Minerals: vesicles mostly filled with greenish material 9. Encrustations: alteration rim up to 2cm							GNS	
SO255-DR167-12	1. Rock Type: volcanic, basalt, hydrothermally altered, hydrothermal group 2. Size: 17x14x12cm 3. Shape / Angularity: rounded 4. Color of cut surface: dark grey core, pale green rim 5. Texture / Vesicularity: porphyric 30% phenocryts, vesicles 5-10% <5mm 6. Phenocrysts: Fsp 30% <4mm altered; Px 5% <4mm altered, Ol? 5% <1mm altered 7. Matrix: fine grained 8. Secondary Minerals: vesicles and veins altered and filled with brown, yellow or green material 9. Encrustations: alteration rim up to 3cm							GNS	
SO255-DR167-13	1. Rock Type: volcanic, basalt, hydrothermally altered, hydrothermal group 2. Size: 19x15x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, brown rim 5. Texture / Vesicularity: porphyric, some large vesicles up to 1.5cm, some small vesicles 10% <3mm filled 6. Phenocrysts: Fsp 25% <4mm; Px 10% <6mm altered 7. Matrix: fine grained 8. Secondary Minerals: green vesicle fillings, CC							GNS	
SO255-DR167-14	1. Rock Type: volcanic, basalt, hydrothermally altered, hydrothermal group 2. Size: 20x18x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey core, brownish green rim 5. Texture / Vesicularity: porphyric, small vesicles filled, larger open 6. Phenocrysts: Fsp 25% <5mm, Px 10% <6mm altered 7. Matrix: fine grained 8. Secondary Minerals: vesicle fillings CC greenish white							GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR167-15	1. Rock Type: volcanic, sediment, hydrothermally altered, hydrothermal group 2. Size: 26x17x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey, brownish rim 5. Texture / Vesicularity: dense, matrix supported, no vesicles 7. Matrix: medium grained, well sorted 10. Comment: consolidated mud-sand, carbonate							GNS	
SO255-DR167-16	1. Rock Type: volcanic, sediment, hydrothermally altered, hydrothermal group 2. Size: 32x17x14cm 3. Shape / Angularity: rounded 4. Color of cut surface: light grey, brownish rim 5. Texture / Vesicularity: dense, matrix supported, no vesicles 7. Matrix: medium grained, poorly sorted 10. Comment: consolidated mud-sand, carbonate, similar to -15							GNS	
SO255-DR167-17	1. Rock Type: volcaniclastic, hydrothermally altered, hydrothermal group 2. Size: 25x17x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark blue / grey, dark green 5. Texture / Vesicularity: dense, clasts from <1mm to 2.5cm ø 7. Matrix: fine grained 8. Secondary Minerals: blue grey brown alteration at core 9. Encrustations: olive green altration rim up to 2cm							GNS	
SO255-DR167-18	1. Rock Type: volcanic, basalt clasts and hydrothermal precipitates / mineralization, large baryte, hydrothermally altered, hydrothermal group 2. Size: 22x17x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: multicolored black clasts and mostly white hydrothermal baryte precipitates 5. Texture / Vesicularity: 6. Phenocrysts: mostly idiomorphic baryte crystals <2x0.5cm, some muddy fine grained matrix around clasts 7. Matrix: fine grained 8. Secondary Minerals: BaSO4 30% <2cm 9. Encrustations: thin coating 10. Comment: basalt clasts similar to other samples of the lava group, overall sample is very heavy due to baryte							GNS	
SO255-DR167-19	1. Rock Type: hydrothermally altered lava, hydrothermal group 2. Size: 19x13x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey green 5. Texture / Vesicularity: hydrothermally altered corebut 2-3 cm seawater alterewd halo, brecciated 6. Phenocrysts: pyrite; probabaly some baryte in pore space 10. Comment: similar to as described for DR17. Late pick by CTIMM, may have gone entirely to GNS							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR167-20	1. Rock Type: pyrite rich hydrothermally altered lava, hydrothermal group 2. Size: 22x14x9cm 3. Shape / Angularity: rounded 4. Color of cut surface: multicolored 5. Texture / Vesicularity: dense altered lava with disseminated pyrite, heavy 6. Phenocrysts: pyrite, maybe some BaSO4 7. Matrix: fine medium grained 8. Secondary Minerals: altered and filled cracks 9. Encrustations: brown alteration halo with soft altered material on out side 10. Comment: Late pick by CTIMM, may have gone entirely to GNS							GNS	
SO255-DR167-21	1. Rock Type: hydrothermally altered lava, hydrothermal group 2. Size: 18x12x11cm 7. Matrix: fine grained 10. Comment: Late pick by CTIMM, may have gone entirely to GNS							GNS	

SO255-DR168

Description of Location and Structure: Kermadec Ridge / Volcanic Front, small cone ø 6.5km 10nm S of DR167 along NE flank. Cone located directly at base of Kermadec Ridge

Dredge on bottom UTC 06/04/17 23:46hrs, lat 33 16.85'S, long 179 49,67'E, depth 2039m
Dredge off bottom UTC 07/04/17 01:17hrs, lat 33 16,91'S, long 179 49,76'E, depth 1953m
total volume: one rock
Comments: small piece Mn encrusted, freshly broken very strongly altered vesicular lava.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR168-1	1. Rock Type: Mn crust on highly vesicluar, strongly altered lava fragment 2. Size: 20x10x5cm 3. Shape / Angularity: platy, rounded on surface; lava freshly broken off ground 4. Color of cut surface: lava dark grey in small areas where fresh and vesicle free 5. Texture / Vesicularity: slightly Ol-Px phyric , 30% vesicles <2mm mostly filled 6. Phenocrysts: Ol altered <1% <0.5mm; Px altered <1% <0.5mm 7. Matrix: fine grained, lots of open mirco vesicles 8. Secondary Minerals: iddingsite 9. Encrustations: 1-2cm Mn crust 10. Comment: Mn crust to be cut off with saw that has thinner blade. Overall difficult to prepare for geochemistry. Effort questionable in light of very fresh volcanic front material.	x	x	2	GL			GNS?	

SO255-DR169

Description of Location and Structure: Volcanic Front, circular shaped small cone ~15nm NW of Kermadec Ridge, track along NE flank in mid-section

Dredge on bottom UTC 07/04/17 04:45hrs, lat 33 20.62'S, long 179 50,47'E, depth 2200m
Dredge off bottom UTC 07/04/17 06:15hrs, lat 33 20,93'S, long 179 50,13'E, depth 1791m
total volume: 1/3 full
Comments: Two lava units identified; -1 to 10 Ol-Px phyric pillow basalt and -11 to -16 Fsp-Px phyric lava

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR169-1A	1. Rock Type: basalt, fresh 2. Size: 33x32x22cm original size of block I; sample piece A: 17x11x15cm, sample piece B: 17x15x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 10% vesicles <4mm 6. Phenocrysts: Px 10% <4mm; Ol 7% <9mm; Fsp 3% <2mm 7. Matrix: fine grained 9. Encrustations: 4mm glass 10. Comment: fresh minerals	x	x		GL			GNS	
SO255-DR169-1B	1. Rock Type: basalt, fresh 2. Size: 33x32x22cm original size of block I; sample piece A: 17x11x15cm, sample piece B: 17x15x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 10% vesicles <3mm 6. Phenocrysts: Px 10% <4mm; Ol 7% <8mm; Fsp 2% <3mm 7. Matrix: fine grained 9. Encrustations: 4mm glass 10. Comment: fresh minerals				GL				
SO255-DR169-2	1. Rock Type: volcanic, basalt fresh 2. Size: 13x7x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 15% vesicles <3mm 6. Phenocrysts: Px 7% <6mm; Ol 5% <5mm; Fsp 1% <2mm 7. Matrix: fine grained 9. Encrustations: 2mm glass 10. Comment: fresh minerals	x	x					GNS	
SO255-DR169-3	1. Rock Type: volcanic, basalt fresh 2. Size: 12x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 13% vesicles <6mm 6. Phenocrysts: Px 5% <4mm; Ol 6% <4mm; Fsp 1% <3mm 7. Matrix: fine grained 9. Encrustations: 2mm glass 10. Comment: fresh minerals	x	x						
SO255-DR169-4	1. Rock Type: volcanic, basalt fresh 2. Size: 10x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black grey to black 5. Texture / Vesicularity: porphyric , 10% vesicles <4mm 6. Phenocrysts: Px greenish 15% <4mm; Ol yellowish 5-10% <3mm; Fsp <1% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust; 2-3mm glass rim at chilled margin 10. Comment: fresh Ol, fairly fresh Px, glass	x	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR169-5	1. Rock Type: volcanic, basalt fresh 2. Size: 7x6x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey to black 5. Texture / Vesicularity: porphyric, 15-20% vesicles <10mm 6. Phenocrysts: Px greenish 10-15% <4mm; Ol yellowish 10-15% <5mm; Fsp <1% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust; 2-3mm glass rim at chilled margin 10. Comment: fresh Ol, fairly fresh Px, glass				GL			GNS	
SO255-DR169-6	1. Rock Type: volcanic, basalt fresh 2. Size: 8x5x6cm 3. Shape / Angularity: subangular to subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 15% vesicles <4mm 6. Phenocrysts: Px greenish 15% <2mm; Ol yellowish 10% <3mm; Fsp <1% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust; 4mm glass rim at chilled margin 10. Comment: fresh Ol, fairly fresh Px, glass				GL				
SO255-DR169-7	1. Rock Type: volcanic, basalt fresh 2. Size: 7x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 20-25% vesicles <7mm 6. Phenocrysts: Px greenish 10% <6mm; Ol yellowish 5% <3mm; Fsp <1% <3mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust; 3mm glass rim at chilled margin 10. Comment: fresh Ol, fairly fresh Px, glass				GL				
SO255-DR169-8	1. Rock Type: basalt fresh 2. Size: 9x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 7% vesicles <8mm 6. Phenocrysts: Px 5% <4mm; Ol 5% <4mm; Fsp 1% <3mm 7. Matrix: fine grained 9. Encrustations: 1mm glass 10. Comment: fresh minerals							back up	
SO255-DR169-9	1. Rock Type: basalt fresh 2. Size: 9x5x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 10% vesicles <3mm 6. Phenocrysts: Px 7% <5mm; Ol 7% <6mm 7. Matrix: fine grained 10. Comment: fresh minerals							back up	
SO255-DR169-10	1. Rock Type: basalt fresh 2. Size: 17x11x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 15% vesicles <7mm 6. Phenocrysts: Px 5% <3mm; Fsp 15% <5mm 7. Matrix: fine grained 10. Comment: fresh minerals							back up	

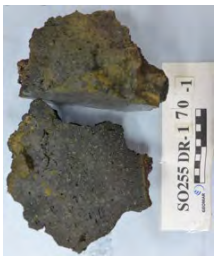
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR169-11A	1. Rock Type: basalt fresh 2. Size: 34x32x30cm original size of block T, sample piece A: 17x11x15cm, sample piece B: 30x18x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 15% vesicles <5mm 6. Phenocrysts: Fsp 15% <5mm; Px 5% <3mm 7. Matrix: fine grained 10. Comment: fresh minerals, A-piece entirely to GNS?							GNS	
SO255-DR169-11B	1. Rock Type: basalt fresh 2. Size: 34x32x30cm original size of block T, sample piece A: 17x11x15cm, sample piece B: 30x18x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 15% vesicles <6mm 6. Phenocrysts: Fsp 15% <6mm; Px 5% <4mm 7. Matrix: fine grained 9. Encrustations: 1mm glass 10. Comment: fresh minerals	x	x		GL				
SO255-DR169-12A	1. Rock Type: basalt fresh 2. Size: 40x24x22cm original size of block J, sample piece A: 20x18x11cm, sample piece B: 18x13x17cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 7% vesicles <8mm 6. Phenocrysts: Fsp 15% <4mm; Px 5% <3mm; Ol 1% <1mm 7. Matrix: fine grained 9. Encrustations: 4mm glass 10. Comment: fresh minerals	x	x		GL				
SO255-DR169-12B	1. Rock Type: basalt fresh 2. Size: 40x24x22cm original size of block J, sample piece A: 20x18x11cm, sample piece B: 18x13x17cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 7% vesicles <8mm 6. Phenocrysts: Fsp 15% <5mm; Px 5% <3mm; Ol 1% <1mm 7. Matrix: fine grained 9. Encrustations: 4mm glass 10. Comment: fresh minerals								
SO255-DR169-13	1. Rock Type: basalt fresh 2. Size: 22x14x12cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 10% vesicles <3mm 6. Phenocrysts: Fsp 20% <4mm; Px 3% <3mm 7. Matrix: fine grained 9. Encrustations: 2mm glass 10. Comment: fresh minerals	x	x		GL			GNS	
SO255-DR169-14	1. Rock Type: basalt fresh 2. Size: 19x15x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, ~20% vesicles <10mm 6. Phenocrysts: Fsp 15-20% <4mm; Px 5% <3mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust, ~3mm glass 10. Comment: fairly fresh Plg, glass	x	x		GL				

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR169-15	1. Rock Type: basalt fresh 2. Size: 16x13x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 20% vesicles <2mm 6. Phenocrysts: Fsp 15% <4mm; Px 2% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust, 2-3mm glass rim 10. Comment: glass rim				GL				
SO255-DR169-16A	1. Rock Type: basalt fresh 2. Size: 25x22x18cm orginal size of block M; sample piece A: 26x10x14cm; sample piece B: 22x16x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 20% vesicles <3mm 6. Phenocrysts: Plg ~15% <4mm; Px 5-10% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: fairly fresh Plg								
SO255-DR169-16B	1. Rock Type: basalt fresh 2. Size: 25x22x18cm orginal size of block M; sample piece A: 26x10x14cm; sample piece B: 22x16x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 20% vesicles <3mm 6. Phenocrysts: Plg ~15% <4mm; Px ~10% <3mm 7. Matrix: fine grained 9. Encrustations: 1mm Mn crust, 2-3mm glass rim 10. Comment: fairly fresh Plg, glass				GL			GNS	

SO255-DR170

Description of Location and Structure: Volcanic Front Kermadec, large volcano with characteristic NS-SW aligned ridge cutting across the edifice, NW flank beneath summit.

Dredge on bottom UTC 07/04/17 08:05hrs, lat 33 24.14'S, long 179 51,79'E, depth 1480m
Dredge off bottom UTC 07/04/17 09:29hrs, lat 33 24,18'S, long 179 52,11'E, depth 1094m
total volume: full
Comments: many large boulders of mainly Ol-Px phyric lava (-1 to -6), -7 & -8 small aphyric samples (flow top breccia), lots of scoria material, lots of biology

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR170-1	1. Rock Type: volcanic, Ol-Px basalt, core fresh, small alteration rim 2. Size: 35x23x23cm original size of block U, sample piece 20x17x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 15% vesicles <12mm 6. Phenocrysts: Px green 10% <13mm; Ol yellowish ~5% 3mm; Plg 1-2% <3mm 7. Matrix: fine grained 8. Secondary Minerals: some vesicles filled with sediments, vesicles altered 9. Encrustations: <1mm Mn crust, 2mm palagonite chilled margin 10. Comment: fresh Ol, fairly fresh Px	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR170-2	1. Rock Type: volcanic, Ol-Px basalt, core fresh, small alteration rim 2. Size: 27x18x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 15% vesicles <7mm; some cracks 6. Phenocrysts: Px greenish 15% <4mm; Ol yellowish ~10% 6mm; Plg <2% <4mm 7. Matrix: fine grained 8. Secondary Minerals: cracks filled with sediment 9. Encrustations: <1mm Mn crust, 3mm palagonite 10. Comment: fresh Ol, fairly fresh Px	x	x					GNS	
SO255-DR170-3	1. Rock Type: volcanic, Ol-Px basalt, core fresh, small alteration rim 2. Size: 20x19x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20% vesicles <4mm, some cracks 6. Phenocrysts: Px green ~10% <5mm; Ol yellowish ~10% 5mm; Plg 1-2% <2mm 7. Matrix: fine grained 8. Secondary Minerals: some cracks and vesicles filled with sediment 9. Encrustations: <1mm Mn crust, 2mm palagonite chilled margin 10. Comment: fresh Ol, fairly fresh Px	x	x					GNS	
SO255-DR170-4	1. Rock Type: volcanic, Ol-Px basalt, core fresh, small alteration rim 2. Size: 40x25x20cm original size of block H, sample piece 21x18x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20% vesicles <2mm 6. Phenocrysts: Px green 10% <8mm; Ol yellowish 5-10% 8mm; Plg 1-2% <2mm 7. Matrix: fine grained 8. Secondary Minerals: 9. Encrustations: <1mm Mn crust, 2mm palagonite chilled margin 10. Comment: fresh Ol, fresh Px	x	x						
SO255-DR170-5	1. Rock Type: volcanic, Ol-Px phyric basalt, fresh core, altered rim 2. Size: 20x13x11cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20% vesicles 6. Phenocrysts: Px 20% <3mm; Ol 15% <4mm; Plg 3% <2mm 7. Matrix: fine grained 8. Secondary Minerals: palagonite 9. Encrustations: 2mm altered glass rim 10. Comment: fresh Ol, fresh Px	x	x						
SO255-DR170-6	1. Rock Type: volcanic, Px phyric basalt, fresh 2. Size: 25x18x16cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 25% vesicles 6. Phenocrysts: Px 25% <3mm 7. Matrix: fine grained 10. Comment: different from -1 throug-4							GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR170-7	1. Rock Type: volcanic, aphyric lava, basaltic-andesitic, fresh 2. Size: 13x10x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: aphyric , core dense <<1mm vesicles , rim 20% <5mm vesicles 6. Phenocrysts: Px 2% <1mm 7. Matrix: fine grained 10. Comment: different from others							GNS	
SO255-DR170-8	1. Rock Type: volcanic, aphyric lava, basaltic-andesitic, fresh 2. Size: 18x16x10cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric , round vesicles 6. Phenocrysts: Px 1% <1mm; Fsp 1% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: different from others							GNS	
SO255-DR170-9	1. Rock Type: sediment, Mn crust 2. Size: 12x12x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: layered, 5mm units, 8 layers 6. Phenocrysts:orange ash, medium grained is one layer 9. Encrustations: Mn crust, 8 layers each 8mm								
SO255-DR170-10X	1. Rock Type: volcanic, Ol-Px phyric basalt, fresh core, altered rim, glass 2. Size: 17x15x12cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric 35%, 20% vesicles ~1cm, altered glass 6. Phenocrysts: Px 20% <4mm; Ol 8% <1mm; Fsp 5% <3mm 7. Matrix: fine grained 8. Secondary Minerals: palagonite 9. Encrustations: 15mm altered glass rim, <1mm Mn crust 10. Comment: back up sample							back up	
SO255-DR170-11X	1. Rock Type: volcanic, Ol-Px phyric basalt, fresh 2. Size: 16x8x7cm 3. Shape / Angularity: angular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric 20% , 8% vesicles 6. Phenocrysts: Px 13% <4mm; Ol 5% <2mm; Fsp 2% <1mm 7. Matrix: fine grained 10. Comment: back up sample							back up	
SO255-DR170-12X	1. Rock Type: volcanic, Ol-Px phyric basalt, altered rim 2. Size: 10x9x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 5. Texture / Vesicularity: porphyric 30% , core 20% vesicles, rim dense 6. Phenocrysts: Px 15% <4mm; Ol 10% <3mm; Fsp 3% <2mm 7. Matrix: fine grained 8. Secondary Minerals: palagonite 9. Encrustations: 5mm altered glass rim, maybe biology 10. Comment: back up sample							back up	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR170-13X	1. Rock Type: volcanic, Ol-Px phyric basalt, altered rim 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey 7. Matrix: fine grained 10. Comment: back up sample, desription on hard copy only							back up	

SO255-DR171

Description of Location and Structure: Volcanic Front Kermadec, Ngatoroirangi Volcano; eruption vent on mid northern flank

Dredge on bottom UTC 07/04/17 12:31hrs, lat 33 39.04'S, long 179 47,51'E, depth 2318m
Dredge off bottom UTC 07/04/17 13:27hrs, lat 33 39,31'S, long 179 47,87'E, depth 2169m
total volume: very few rocks
Comments: Three pieces of evoloved lava; almost pumiceous, all samples entirely to JAMSTEC

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR171-1	1. Rock Type: volcanic, Px phyrirc andesite - dacite, fresh, pumiceous 2. Size: 11x10x6cm 3. Shape / Angularity: angular to subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric , 25% vesicles in core, dense along rim 6. Phenocrysts: Px 10% <4mm; Plg 5-10% <2mm, ø1mm lithics 7. Matrix: fine grained, rock fragments? 10. Comment: fresh no Mn							JAMSTEC	
SO255-DR171-2	1. Rock Type: volcanic, Px phyrirc andesite - dacite, fresh, pumiceous 2. Size: 8x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: 10% vesicles, containplutonic rock fragments 6. Phenocrysts: Px 5% <2mm; Plg 2% <1mm, ø1mm lithics, single plutonic rock fragment ø5mm 7. Matrix: fine 9. Encrustations: fresh no Mn 10. Comment: similar to -1							JAMSTEC	
SO255-DR171-3	1. Rock Type: volcanic, Px phyrirc andesite - dacite, fresh, pumiceous 2. Size: 7x6x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric , 15% vesicles, rock fragments 6. Phenocrysts: Px 2% <1mm; Plg 2% <1mm 7. Matrix: fine grained 9. Encrustations: fresh no Mn 10. Comment: similar to -1 and -2							JAMSTEC	

SO255-DR172

Description of Location and Structure: Volcanic Front Kermadec, Ngatoroirangi Volcano; small vent structure on NW flank of the volcano

Dredge on bottom UTC 07/04/17 15:25hrs, lat 33 41.01'S, long 179 52,04'E, depth 2026m

Dredge off bottom UTC 07/04/17 16:24hrs, lat 33 41,29'S, long 179 52,04'E, depth 1903m

total volume: very few rocks

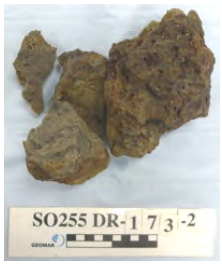
Comments: Three pieces of Plg-Px phyric basaltic lavas, one small peice of Plg-Px-Ol lava, due to small peices all samples entirely to JAMSTEC, except -2 that is shared with GEOMAR and GNS

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR172-1	1. Rock Type: volcanic, basalt, fresh 2. Size: 7x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 5% vesicles <4mm 6. Phenocrysts: Plg 10% <4mm; Px 2% <2mm; Ol?? <1% 7. Matrix: fine grained 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR172-2	1. Rock Type: volcanic, basalt, fresh; Plg phyric 2. Size: 21x16x15cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 5% vesicles 6. Phenocrysts: Plg 30% <3mm 7. Matrix: fine grained 8. Secondary Minerals: fresh 9. Encrustations: <5mm glass 10. Comment: Plg phyric							JAMSTEC, GEOMAR, GNS	
SO255-DR172-3	1. Rock Type: volcanic, basalt, fresh, Plg phyric 2. Size: 8x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 5% vesicles <4mm 6. Phenocrysts: Plg 20% <4mm; Px 2-5% <1mm 7. Matrix: fine grained 8. Secondary Minerals: fresh 9. Encrustations: 5mm chilled margin 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR172-4	1. Rock Type: volcanic, basalt, fresh, Plg phyric 2. Size: 6x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 5% vesicles 6. Phenocrysts: Plg 20% <2mm; Px 2% <1mm 7. Matrix: fine grained 8. Secondary Minerals: fresh 9. Encrustations: 1mm chilled margin 10. Comment: entire piece to JAMSTEC							JAMSTEC	

SO255-DR173

Description of Location and Structure: Volcanic Front Kermadec, Ngatoroirangi Volcano; base of western flank across small ridge / vent?

Dredge on bottom UTC 07/04/17 19:19hrs, lat 33 44.01'S, long 179 42,71'E, depth 2431m
Dredge off bottom UTC 07/04/17 20:04hrs, lat 33 44,25'S, long 179 42,85'E, depth 2311m
total volume: few rocks
Comments: andesitic-dacitic pumice with a few % Px or Amph phenocrysts

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR173-1	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 14x10x8cm 3. Shape / Angularity: angular 4. Color of cut surface: yellowish grey, partly dark grey 5. Texture / Vesicularity: slightly phyric , 30% vesicles 6. Phenocrysts: Plg 3% <1mm; Px or Amph 3% max 4mm 7. Matrix: fine grained 9. Encrustations: none, fresh, some biology 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR173-2	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 15x15x11cm 3. Shape / Angularity: angular 4. Color of cut surface: yellowish grey, partly dark grey 5. Texture / Vesicularity: slightly phyric , 30% vesicles, dark grey line 6. Phenocrysts: Plg 2% <2mm; Px or Amph 2% <3mm 7. Matrix: fine grained 9. Encrustations: none, fresh, some biology 10. Comment: contains rock / lava fragments,mentire piece to JAMSTEC							JAMSTEC	
SO255-DR173-3	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 8x7x5cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellowish grey, partly dark grey 5. Texture / Vesicularity: slightly phyric , 15% vesicles 6. Phenocrysts: Plg 1% <1mm; Px or Amph 1% <1mm 7. Matrix: fine grained 9. Encrustations: none, fresh, some biology 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR173-4	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 8x7x5cm 3. Shape / Angularity: angular 4. Color of cut surface: yellowish grey, partly dark grey 5. Texture / Vesicularity: slightly phyric , 33% vesicles 6. Phenocrysts: Plg not visible; Px or Amph 1% < 1mm 7. Matrix: fine grained 9. Encrustations: none, fresh, some biology 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR173-5	1. Rock Type: pumice? lava?, andesitic-dacitic, fresh, entirely dark grey 2. Size: 9x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark grey 5. Texture / Vesicularity: aphyric , 3% vesicles, wave texture 6. Phenocrysts: aphyric Qtz? ~2% <0.2mm 7. Matrix: fine grained 9. Encrustations: none, fresh 10. Comment: entire piece to JAMSTEC							JAMSTEC	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR173-6	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 8x8x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly phyric , 20% vesicles 6. Phenocrysts: Plg 2% <0.2mm; Px or Amph 2% <2mm 7. Matrix: fine grained 9. Encrustations: none, fresh 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR173-7	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 8x7x5cm 3. Shape / Angularity: rounded 4. Color of cut surface: yellowish dark brown 5. Texture / Vesicularity: banded color, 10% vesicles 6. Phenocrysts: aphyric Px or Amph 1% <1mm 7. Matrix: fine grained 9. Encrustations: none, fresh, some biology 10. Comment: entire piece to JAMSTEC, similar to -5 in color							JAMSTEC	
SO255-DR173-8	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 7x6x6cm 3. Shape / Angularity: rounded 4. Color of cut surface: yellowish grey 5. Texture / Vesicularity: slightly phyric , 10% vesicles, partly dark brown 6. Phenocrysts: Plg 1% <1mm; Px 2% <2mm 7. Matrix: fine grained 9. Encrustations: none, fresh 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR173-9	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 10x8x5cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly phyric , 20% vesicles, banded texture 6. Phenocrysts: Plg 1% <1mm; Px or Amph 2% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR173-10	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 12x9x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey to dark grey 5. Texture / Vesicularity: 30% vesicles, banded texture, partly dark brown 6. Phenocrysts: Px or Amph 3% <2mm 7. Matrix: fine grained 9. Encrustations: some biology 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR173-11	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 11x7x6cm 3. Shape / Angularity: angular 4. Color of cut surface: grey 5. Texture / Vesicularity: rock fragments in 1.2cm ø vesicle , 30% vesicles 6. Phenocrysts: Px or Amph 2% <3mm 7. Matrix: fine grained 9. Encrustations: fresh 10. Comment: contains lithic fragments, entire piece to JAMSTEC							JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR173-12	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 8x6x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: yellowish brown 5. Texture / Vesicularity: slightly phyric, 10% vesicles 6. Phenocrysts: uncut but appears aphyric 7. Matrix: fine grained 9. Encrustations: <2mm Mn crust 10. Comment: entire piece to JAMSTEC							JAMSTEC	
SO255-DR173-13	1. Rock Type: pumice, andesitic-dacitic, fresh 2. Size: 6x5x4cm 3. Shape / Angularity: subangular 4. Color of cut surface: yellowish brown 5. Texture / Vesicularity: 30% vesicles 6. Phenocrysts: no cutting but Px or Amph <1% visible 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: entire piece to JAMSTEC							JAMSTEC	

SO255-DR174

Description of Location and Structure: Havre Trough, deep basin SW of Ngatoroirangi Volcano; E-W striking ridge at eastern end of basin, NW dipping slope at the end of the ridge.

Dredge on bottom UTC 07/04/17 23:53hrs, lat 33 50.35'S, long 179 33,48'E, depth 3630m
Dredge off bottom UTC 08/04/17 00:48hrs, lat 33 50,62'S, long 179 33,65'E, depth 3322m
total volume: very few rocks
Comments: one very small Ol phyric lava with chilled margin and another small piece of lava

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR174-1	1. Rock Type: volcanic, basalt, fresh, slightly Ol phyric 2. Size: 10x9x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly phyric , 30% vesicles, <1mm 20%, 1-6mm 10% 6. Phenocrysts: Ol 5% <1mm fresh 7. Matrix: fine grained	x	x		GL			GNS	
SO255-DR174-2	1. Rock Type: volcanic, basalt, fresh, slightly Ol phyric 2. Size: 7x5x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: slightly phyric , 30% vesicles <2mm 6. Phenocrysts: Ol 5% <1mm fresh, Fsp very thin needles <1%, <1mm 7. Matrix: fine grained	x	x					GNS	

SO255-DR175

Description of Location and Structure: Havre Trough, same basin as DR174, mound like structure at very base of NE-SW striking basin. NW flank from base to top, very minimal elevation difference.

Dredge on bottom UTC 08/04/17 03:50hrs, lat 33 48.55'S, long 179 30,61'E, depth 3814m
Dredge off bottom UTC 08/04/17 04:32hrs, lat 33 48,79'S, long 179 30,76'E, depth 3744m
total volume: empty

SO255-DR176

Description of Location and Structure: Volcanic Front, cone south of Ngatoroirangi Volcano; NW flank mid section

Dredge on bottom UTC 08/04/17 08:20hrs, lat 33 52.10'S, long 179 48,96'E, depth 2147m

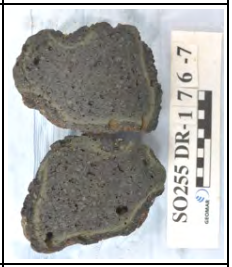
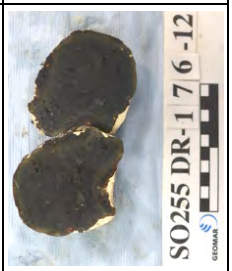
Dredge off bottom UTC 08/04/17 09:30hrs, lat 33 52,48'S, long 179 49,11'E, depth 1896m

total volume: few large and many small rocks

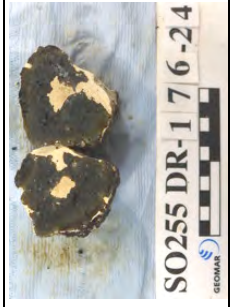
Comments: decent amount of pillow lava; Px-Ol ± Plg phyric; 26 samples overall with glass

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR176-1	1. Rock Type: volcanic, Ol-Px basalt, fresh pillow 2. Size: 18x16x13cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20% vesicles 6. Phenocrysts: Ol 5-10% <2mm fresh; Px 8-15% <3mm, Plg ~3% <1mm 7. Matrix: fine grained 9. Encrustations: 1cm chilled margin with 5mm glass	x	x		GL			JAMSTEC, GNS	
SO255-DR176-2	1. Rock Type: volcanic, Ol-Px basalt, fresh pillow 2. Size: 29x13x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 15% vesicles 6. Phenocrysts: Ol 5% <1mm fresh; Px 10% <4mm, Plg ~2% <1mm 7. Matrix: fine grained 9. Encrustations: 1cm chilled margin with 8mm glass	x	x		GL			JAMSTEC, GNS	
SO255-DR176-3	1. Rock Type: volcanic, Ol-Px basalt, fresh pillow 2. Size: 14x11x10cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 8% vesicles 6. Phenocrysts: Ol 5% <1mm fresh; Px 8% <4mm, Plg ~5% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm glass	x	x					JAMSTEC, GNS	
SO255-DR176-4	1. Rock Type: volcanic, Ol-Px basalt, fresh pillow 2. Size: 14x10x8cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 3% vesicles 6. Phenocrysts: Ol 2% <1mm fresh; Px 10% <2mm, Plg ~5% <2mm 7. Matrix: fine grained 10. Comment: similar to -3	x	x					JAMSTEC	
SO255-DR176-5	1. Rock Type: volcanic, Ol-Px basalt, fresh pillow 2. Size: 14x10x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , decresing vesicle size from core to rim 2cm ---> 1mm 6. Phenocrysts: Ol 2% <1mm fresh; Px 15% <4mm, Plg ~2% <2mm 7. Matrix: fine grained 9. Encrustations: 2.5cm chilled margin with 15mm glass				GL			JAMSTEC	
SO255-DR176-6	1. Rock Type: volcanic, Ol-Px basalt, fresh pillow 2. Size: 12x6x9cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: slightly phyric, 15% vesicles 6. Phenocrysts: Ol 2% <2mm; Px 3% <1mm, Plg ~1% <1mm 7. Matrix: fine grained 10. Comment: differs from other samples by lower % of phenocrysts	x	x		GL			JAMSTEC, GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR176-7	1. Rock Type: volcanic, Ol-Px basalt, fresh pillow 2. Size: 12x12x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 15% vesicles 6. Phenocrysts: Ol 3% <2mm; Px 10% <3mm, Plg <1% <1mm 7. Matrix: fine grained 9. Encrustations: 1cm chilled margin with 8mm glass							JAMSTEC, GNS	
SO255-DR176-8	1. Rock Type: volcanic, Ol-Px basalt, fresh pillow 2. Size: 8x6x5cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 1% vesicles 6. Phenocrysts: Ol 3% <1mm; Px 10% <4mm, Plg ~1% <1mm 7. Matrix: fine grained							JAMSTEC	
SO255-DR176-9	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 14x8x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20-25% vesicles <8mm 6. Phenocrysts: Ol 3% <2mm fresh; Px 5-10% <8mm, Plg ~3% <2mm 7. Matrix: fine grained 9. Encrustations: <8mm rim of sediments, <1mm Mn crust							JAMSTEC, GNS	
SO255-DR176-10	1. Rock Type: volcanic, Ol-Px basalt, altered rim fresh core 2. Size: 7x9x13cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 15-20% vesicles <4mm 6. Phenocrysts: Ol 3% <2mm fresh; Px 5-10% <5mm, Plg ~5% <3mm 7. Matrix: fine grained 9. Encrustations: up to 1cm rim of sediments, 2mm brownish / orange palagonite margin							JAMSTEC, GNS?	
SO255-DR176-11	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 9x4x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20% vesicles <4mm 6. Phenocrysts: Px 10% <4mm, Plg 5-8% <2mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	
SO255-DR176-12	1. Rock Type: volcanic, Ol-Px basalt, slightly altered rim, fresh core 2. Size: 9x6x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric, 15-20% vesicles <1mm some up to 5mm 6. Phenocrysts: Px 10-15% <5mm, Plg 10% <2mm; Ol 5% <2mm 7. Matrix: fine grained 9. Encrustations: <4mm rim of sediments, 2mm brownish / orange palagonite margin 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR176-13	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 10x7x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 50% vesicles 6. Phenocrysts: Px 5% <1.5mm, Plg 1% <1mm; Ol 2% <1mm 7. Matrix: fine grained 9. Encrustations: 1cm glass 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	
SO255-DR176-14	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 17x12x8cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 40% vesicles 6. Phenocrysts: Px 12% <2mm; Ol 5% <1mm 7. Matrix: fine grained 9. Encrustations: 1cm glass 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	
SO255-DR176-15	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 13x8x7cm 3. Shape / Angularity: angular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 30% vesicles 6. Phenocrysts: Px ~8% <2mm, Plg 3% <1mm; Ol 7% <4mm 7. Matrix: fine grained 9. Encrustations: 1mm glass 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	
SO255-DR176-16	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 8x8x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 15% vesicles <4mm 6. Phenocrysts: Px 8% <2mm, Plg 5% <1mm; Ol 3% <1mm 7. Matrix: fine grained 9. Encrustations: 5mm glass 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	
SO255-DR176-17	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 8x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20% vesicles <6mm 6. Phenocrysts: Px 5% <2mm, Plg 10% <3mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust, <2mm glass rim, chilled margin 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	
SO255-DR176-18	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 10x7x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20-25% vesicles <4mm 6. Phenocrysts: Px 10% <4mm, Ol yellowish 1-2% <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust, 1-2mm glass rim 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR176-19	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 10x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20-25% vesicles up to 8mm 6. Phenocrysts: Px 5-10% <2mm; Plg 5% <1mm; Ol 1-2% <1mm 7. Matrix: fine grained 9. Encrustations: 1-2mm glass rim 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	
SO255-DR176-20	1. Rock Type: volcanic, Ol-Px basalt, fresh 2. Size: 12x8x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black 5. Texture / Vesicularity: porphyric , 20% vesicles <4mm 6. Phenocrysts: Px 5% <2mm, Plg 5% <3mm 7. Matrix: fine grained 9. Encrustations: up to 3mm rim of sediments 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	
SO255-DR176-21	1. Rock Type: volcanic, basalt, slightly altered 2. Size: 10x7x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black to grey 5. Texture / Vesicularity: porphyric , 10% vesicles <4mm, some vesicles filled with sediment 6. Phenocrysts: Px 5% <3mm greenish, Plg 10% <4mm; Ol 1-2% <2mm 7. Matrix: fine grained 9. Encrustations: ~3mm rim of sediments, ~2mm brownish rim of palagonite Mn 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	
SO255-DR176-22	1. Rock Type: volcanic, Ol-Px basalt, slightly altered 2. Size: 8x7x5cm 10. Comment: similar to -21							JAMSTEC	
SO255-DR176-23	1. Rock Type: volcanic, Ol-Px basalt, slightly altered 2. Size: 7x6x5cm 10. Comment: similar to -21 & -22							JAMSTEC	
SO255-DR176-24	1. Rock Type: volcanic, Ol-Px basalt, slightly altered 2. Size: 7x5x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric , 5% vesicles up to 1.7cm some filled with sediement 6. Phenocrysts: Ol yellowish <1% <1mm; Px ~5% <5mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with sediment 9. Encrustations: 2mm palagonite, chilled margin, up to 6mm sediment rim 10. Comment: -11 through -26 entirely to JAMSTEC							JAMSTEC	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR176-25	1. Rock Type: volcanic, Ol-Px basalt, slightly altered 2. Size: 6x3x3cm 10. Comment: similar to -24, entirely to JAMSTEC							JAMSTEC	
SO255-DR176-26	1. Rock Type: volcanic, Ol-Px basalt, slightly altered 2. Size: 5x6x4cm 10. Comment: similar to -24 & -25, entirely to JAMSTEC							JAMSTEC	

SO255-DR177

Description of Location and Structure: Kermadec Ridge, seamount like structure on on western margin of Kermadec Ridge

Dredge on bottom UTC 08/04/17 12:03hrs, lat 34 1.11'S, long 179 48,28'E, depth 1802m

Dredge off bottom UTC 08/04/17 13:20hrs, lat 34 1,91'S, long 179 48,36'E, depth 1591m

total volume: empty

SO255-DR178

Description of Location and Structure: Kermadec Ridge, 9nm SE of SONNE seamount, cone like structure at NW margin of K.R., track along upper 1/3 to top

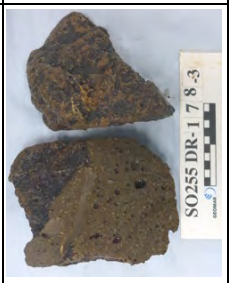
Dredge on bottom UTC 08/04/17 15:42hrs, lat 34 10.01'S, long 179 45,80'E, depth 1200m

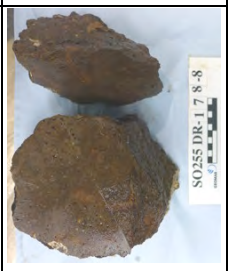
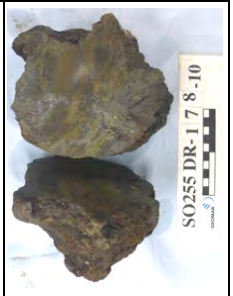
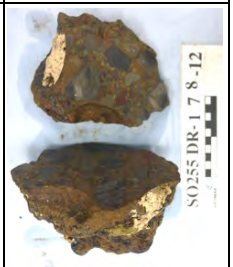
Dredge off bottom UTC 08/04/17 16:45hrs, lat 34 10,25'S, long 179 46,01'E, depth 838m

total volume: 1/4 full

Comments: Mixed bag of dense sheet flow lava; vesicular Plg-phyric lava, volcaniclastic breccia, flow banded evolved lava and sediment. Two large blocks of sediment.

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR178-1	1. Rock Type: volcanic, altered, relativley fresh core, andesitic? 2. Size: 17x16x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric , dense 6. Phenocrysts: Px ~15% <3mm; Fsp 5-10% <2mm 7. Matrix: fine grained 9. Encrustations: 3cm altered rim, <1mm Mn crust 10. Comment: minerals altered, Px-Plg-Ol phyric lava group	x	x					GNS	
SO255-DR178-2	1. Rock Type: volcanic, altered, andesitic? 2. Size: 12x11x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric, dense, vesicles <1% <1mm 6. Phenocrysts: Px ~15% <4mm; Fsp 8% <3mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 1-2% <2mm 9. Encrustations: <1mm Mn crust 10. Comment: minerals altered, Px-Plg-Ol phyric lava group	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR178-3	1. Rock Type: volcanic, basalt, altered, andesitic? 2. Size: 16x15x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: porphyric, vesicles 10-15% <1.4cm 6. Phenocrysts: Px black <5% <2mm; Plg altered yellowish brownish 20% <5mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite <2% <1mm; some vesicles filled with black and brownish stuff 9. Encrustations: <1mm Mn crust 10. Comment: minerals altered, Px-Plg-Ol phyric lava group	x	x					GNS	
SO255-DR178-4	1. Rock Type: volcanic, basalt, altered 2. Size: 12x7x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown grey 5. Texture / Vesicularity: porphyric, vesicles 10-15% <7mm 6. Phenocrysts: Px black bluish 2-3% <3mm; Fsp altered yellowish brownish 15% <4mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with sediment 9. Encrustations: 1cm partial rim of sediment, <1mm Mn crust 10. Comment: minerals altered, Px-Plg-Ol phyric lava group	x	x						
SO255-DR178-5	1. Rock Type: volcanic, basalt, altered 2. Size: 15x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey brown 5. Texture / Vesicularity: porphyric, vesicles 10% <2.5cm 6. Phenocrysts: Px ~3% <3mm; Fsp 15% <4mm 7. Matrix: fine grained 10. Comment: Px-Plg-Ol phyric lava group	x	x					GNS	
SO255-DR178-6	1. Rock Type: volcanic, basalt, altered, similar to -5 2. Size: 15x10x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: dark grey/brown 5. Texture / Vesicularity: porphyric, vesicles 5% <1cm 6. Phenocrysts: Px ~5% <5mm; Fsp 10% <5mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust								
SO255-DR178-7	1. Rock Type: volcanic, basalt, altered 2. Size: 8x5x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown grey 5. Texture / Vesicularity: porphyric 6. Phenocrysts: Px ~3% <3mm; Fsp 7% <4mm 7. Matrix: fine grained 8. Secondary Minerals: iddingsite 2% <1mm 9. Encrustations: 5mm white sediment, <1mm Mn crust 10. Comment: minerals altered, Px-Plg-Ol phyric lava group								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR178-8	1. Rock Type: volcanic breccia 2. Size: 50x35x20cm original size of block O, sample piece 21x18x15cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown, red orange 5. Texture / Vesicularity: monomictic, flow structure visible 6. Phenocrysts: Px <5mm; Fsp <3mm in some clasts 7. Matrix: fine grained 10. Comment: flow structure								
SO255-DR178-9	1. Rock Type: volcanic breccia, altered 2. Size: 13x9x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black-brown 5. Texture / Vesicularity: 10% vesicles <7mm in largest clast, monomictic 6. Phenocrysts: Fsp 10% <5mm in largest clasts 7. Matrix: fine grained 10. Comment: largest clast 8.3x6.3cm							GNS	
SO255-DR178-10	1. Rock Type: volcanic flow structure 2. Size: 21x11x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: black, blue-green 5. Texture / Vesicularity: 3% vesicles <1mm 7. Matrix: fine grained 9. Encrustations: <1mm Mn crust 10. Comment: black & blue green alternating flow banding								
SO255-DR178-11	1. Rock Type: volcanic flow structure 2. Size: 12x7x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: black, blue-green 5. Texture / Vesicularity: 2% vesicles <1mm 6. Phenocrysts: Fsp 3% <1mm 7. Matrix: fine grained 9. Encrustations: 2.2cm coarse sediment with 2x1.5cm volcanic clast 10. Comment: black & blue green flow banding similar to -10								
SO255-DR178-12	1. Rock Type: volcaniclastic rounded clasts 2. Size: 16x16x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: multi-colored 5. Texture / Vesicularity: polymictic 7. Matrix: coarse grained sediment 10. Comment: alteration rims on some clasts, rounded clasts								
SO255-DR178-13	1. Rock Type: sediment 2. Size: 21x11x14cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish 5. Texture / Vesicularity: fractured, well sorted 7. Matrix: fine to medium sand 8. Secondary Minerals: white veins containing sediment fragments up to 1.3cm going along the entire rock 9. Encrustations: <1mm Mn crust								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR178-14	1. Rock Type: sediment 2. Size: 17x12x10cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish 5. Texture / Vesicularity: moderately sorted, kind oftwo layers, veins 7. Matrix: one layer (~4cm) medium to coarse sand, second layer (~3.5cm fine sand, containing some clasts up to 0.5mm 8. Secondary Minerals: veins filled with light brown material 9. Encrustations: <1mm Mn crust								
SO255-DR178-15	1. Rock Type: sediment, volcaniclastic 2. Size: 19x16x9cm 3. Shape / Angularity: rounded 4. Color of cut surface: reddish brown, matrix white 5. Texture / Vesicularity: max 13cm tuff reddish brown and white matrix 6. Phenocrysts: tuff contains 10% Px <1mm 7. Matrix: white matrix ash?, sliceous very fine grained, matrix also contains biological fragments 8. Secondary Minerals: oxidation 9. Encrustations: <1mm Mn crust 10. Comment: reddish brown oxidation								
SO255-DR178-16	1. Rock Type: sediment, volcaniclastic 2. Size: 62x45x37cm original size of block N, sample size 13x12x10cm 3. Shape / Angularity: rounded 4. Color of cut surface: reddish brown, matrix white 5. Texture / Vesicularity: max 2cm white yellowish brown clasts 0.5 to 1cm, fractures 6. Phenocrysts: magnetite 10% <1mm 7. Matrix: sliceous very fine grained ash? 8. Secondary Minerals: magnetite along fractures 9. Encrustations: <0.5mm Mn crust 10. Comment: oxidation								
SO255-DR178-17	1. Rock Type: sediment, consolidated mud 2. Size: 16x12x11cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown 5. Texture / Vesicularity: moderately sorted 7. Matrix: fine to medium sand 8. Secondary Minerals: veins filled with light brown, more fine grained material 9. Encrustations: <1mm Mn patches								
SO255-DR178-18	1. Rock Type: cemented sediment clasts and biogene carbonate shells 2. Size: 19x14x9cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown - beige ---> brown sandy sediment clasts 5. Texture / Vesicularity: breccia like, sediment clasts and carbonate shells in dense matrix 7. Matrix: dense beige matrix - cemented --> carbonate? 10. Comment: anbundant biogene shells								
SO255-DR178-19	1. Rock Type: sediment 2. Size: 20x9x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown 5. Texture / Vesicularity: layered, layers differ by grainsizes, fine sand to granular 7. Matrix: grading from fine to coarse grained 10. Comment: volcaniclastic turbidite?								

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR178-20	1. Rock Type: volcanic, altered basalt 2. Size: 14x6x5cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brownish-grey 5. Texture / Vesicularity: pophyric, moderate vesicular 15% <5mm partly CC filled 6. Phenocrysts: Px 7% <2mm, Fsp 10% <3mm, altered; Ol strongly altered 2% <1mm 7. Matrix: fine grained 8. Secondary Minerals: CC in vesicles 10. Comment: phenocrysts are altered, similar to -1 through -8								
SO255-DR178-21	1. Rock Type: volcanic, strongly altered basalt 2. Size: 14x8x6cm 3. Shape / Angularity: subrounded 4. Color of cut surface: dark brown 5. Texture / Vesicularity: pophyric, moderate vesicular 10% <6mm, filled with mud and sediment 6. Phenocrysts: Fsp 20% <4mm, altered 7. Matrix: fine grained 8. Secondary Minerals: red brown patches in groundmass (Fe-oxide), vesicle fillings, similar to sample -1 through -8								
SO255-DR178-22	1. Rock Type: volcanic, slightly basalt 2. Size: 9x6x4cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey 5. Texture / Vesicularity: pophyric, some large vesicles <1.5cm, partly filled 6. Phenocrysts: Px 3% <2mm slightly, Fsp 35% <4mm, slightly altered; Ol strongly altered 2% <1mm 7. Matrix: fine grained 8. Secondary Minerals: vesicle fillings CC? 10. Comment: similar to -1 through -8								

SO255-DR179

Description of Location and Structure: Kermadec Ridge, 3.5nm SW of DR178, NW facing slope just beneath plateau edge

Dredge on bottom UTC 08/04/17 18:19hrs, lat 34 13.33'S, long 179 42,43'E, depth 1106m

Dredge off bottom UTC 08/04/17 19:26hrs, lat 34 13,56'S, long 179 42,62'E, depth 738m

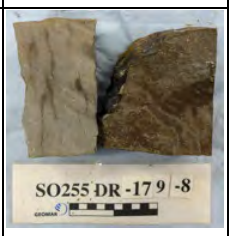
total volume: full

Comments: very heterogeneous dredge with many very large rounded to angular boulders. Samples are subdivided into the following petrographic units; -1 to -4 Ol-Fsp phyric lava; -5 & -6 Fsp-Px phyric lava; -7 to -9 Fsp phyric lava, -10 to -13 less phyric Fsp-Px lava, -14 to -18 aphyric more evolved lava, -19 to -23 volcaniclastic group some with glassy contact zone to lava flow (-19) or with large angular lava clasts (-20).

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR179-1	1. Rock Type: volcanic, altered, 2. Size: 26x20x16cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey 5. Texture / Vesicularity: porphyric , few vesicles ~5% mostly filled with secondary material 6. Phenocrysts: Fsp 5% <1 up to 1.5mm, Px ~10% <1mm up to 2mm ; Ol iddingsite 10% ~1mm 7. Matrix: fine grained 8. Secondary Minerals: alteration of Ol, filling of vesicles 9. Encrustations: thin Mn coating 10. Comment: amount and identity of minerals difficult to judge due to alteration and vesicle filling; Ol could be also altered Px	x	x					GNS	

Appendix 2 (Station Details and Rock Description)

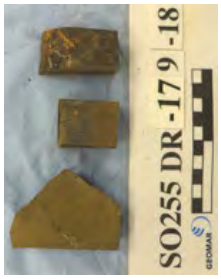
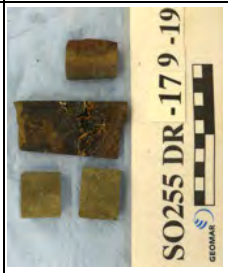
SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR179-2	1. Rock Type: volcanic, altered, 2. Size: 15x10x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: light grey, slightly brownish 5. Texture / Vesicularity: porphyric , few vesicles ~10% some filled with greenish material 6. Phenocrysts: Fsp 7% <1mm, Px ~15% <1mm - 2mm some fresh but most have brown color 7. Matrix: fine grained 8. Secondary Minerals: alteration of Px, filling of vesicles 9. Encrustations: thin Mn coating 10. Comment: strong alteration of Px	x	x						
SO255-DR179-3	1. Rock Type: volcanic, altered, 2. Size: 17x14x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey with brownish veins 5. Texture / Vesicularity: porphyric, few vesicles 3-5% all filled with secondary material 6. Phenocrysts: Fsp 10% 1-2mm, Px 7% 1-3mm both showing strong alteration 7. Matrix: fine grained 8. Secondary Minerals: strong alteration of Px and Fsp, white filling of vesicles 9. Encrustations: thin Mn coating 10. Comment: strongly altered rock	x	x						
SO255-DR179-4	1. Rock Type: volcanic, altered, 2. Size: 74x36x20cm original size of block Q, four pieces sampled 19x11x10cm, 15x10x10cm, 12x10x18cm, 13x8x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey, orange altered parts 5. Texture / Vesicularity: porphyric , few vesicles 5-7% all filled with secondary material 6. Phenocrysts: Fsp 10% 1-3mm, Px 7-10% <1-4mm, both minerals strongly altered 7. Matrix: fine grained 8. Secondary Minerals: alteration of Px and Fsp, filling of vesicles 9. Encrustations: thin Mn coating 10. Comment: strongly altered rock	x	x					GNS	
SO255-DR179-5	1. Rock Type: volcanic, altered, 2. Size: 15x14x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, partly reddish 5. Texture / Vesicularity: porphyric , few vesicles 5% open up to 2mm 6. Phenocrysts: Fsp 10% up to 5mm alteed, Px 5% up to 3mm altered 7. Matrix: fine grained 8. Secondary Minerals: red minerals up to 3mm, 3-5%, mostly overlaying Fsp 9. Encrustations: thin Mn coating 10. Comment: belongs to Fsp-Px group	x	x					GNS	

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR179-6	1. Rock Type: volcanic, altered, 2. Size: 17x13x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey, reddish 5. Texture / Vesicularity: porphyric , few vesicles 1% sub-mm 6. Phenocrysts: Fsp 10% up to 4mm alteed, Px up to 3mm altered 7. Matrix: fine grained 8. Secondary Minerals: Mn fillings in cracks and vesicles, brownish (Mn?) rims around some Fsp 9. Encrustations: thin Mn coating 10. Comment: belongs to Fsp-Px group, compared to -5 more dense groundmass	x	x						
SO255-DR179-7	1. Rock Type: volcanic, altered, 2. Size: 13x8x7cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey to greenish 5. Texture / Vesicularity: porphyric , few vesicles up to 3mm 6. Phenocrysts: Fsp 10% up to 6mm altered 7. Matrix: fine grained 8. Secondary Minerals: vesicles filled with sediment 9. Encrustations: thin coating 10. Comment: outer part of sampl look much more altered than interior, Fsp size varies from sub-mm to large crystals	x							
SO255-DR179-8	1. Rock Type: volcanic, altered, 2. Size: 74x36x20 original size of block C, sample pieces 21x12x10cm, 18x12x6cm, 18x10x6cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric , few vesicles 2% sub-mm, partly filled 6. Phenocrysts: Fsp 7% up to 5mm altered 7. Matrix: fine grained 8. Secondary Minerals: vesicles & cracks filled with reddish sediment or Mn 9. Encrustations: thin coating 10. Comment: belongs Fsp phyric group	x	x					GNS	
SO255-DR179-9	1. Rock Type: volcanic, modertately altered 2. Size: 59x34x20cm original size of block B, two pieces sampled 18x13x10cm, 22x12x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: brownish grey 5. Texture / Vesicularity: porphyric, few vesicles 3-5% unfilled 6. Phenocrysts: Fsp 25% 1-4mm slightly altered 7. Matrix: fine grained 9. Encrustations: thin Mn coating 10. Comment: rock has large amount of phenocrysts	x	x					GNS	
SO255-DR179-10	1. Rock Type: volcanic, altered 2. Size: 19x9x7cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicular 7% some filled with secondary material 6. Phenocrysts: Fsp 7% <1-2mm slightly altered 7. Matrix: fine grained 8. Secondary Minerals: filling of vesicles 9. Encrustations: thin Mn coating	x	x					GNS	

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR179-11	1. Rock Type: volcanic, modertately altered 2. Size: 14x13x8cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, few vesicles <5% all filled with secondary material 6. Phenocrysts: Fsp 15% 1-2mm altered; Px 5% 1-3mm 7. Matrix: fine grained 8. Secondary Minerals: alteration of Fsp, vesicle filling 9. Encrustations: thin Mn coating	x							
SO255-DR179-12	1. Rock Type: volcanic, slightly altered 2. Size: 28x27x19cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: porphyric, vesicular 7% unfilled 6. Phenocrysts: Fsp 10% <1-2mm; Px 1% <1mm, both minerals slightly altered 7. Matrix: fine grained 9. Encrustations: thin Mn coating	x	x					GNS	
SO255-DR179-13	1. Rock Type: volcanic, slightly altered, basaltic andesite 2. Size: 20x20x14cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey-brownish 5. Texture / Vesicularity: less porphyric, vesicular 10% up to 1cm, partly filled 6. Phenocrysts: Fsp 5% up to 3mm; Px <5% up to 3mm 7. Matrix: fine grained small needles Plg? 8. Secondary Minerals: vesicles partly filled with sediment 9. Encrustations: thin coating 10. Comment: belongs to the less phyric Fsp-Px group	x	x					GNS	
SO255-DR179-14	1. Rock Type: volcanic, moderately altered 2. Size: 30x35x18cm original size of block W, sample pieces 18x18x13cm, 17x13x6, 26x18x12cm 3. Shape / Angularity: angular 4. Color of cut surface: grey to brownish 5. Texture / Vesicularity: near aphyric, vesicular 15-20% up to 4mm, partly filled 6. Phenocrysts: Fsp 3% up to 2mm 7. Matrix: fine grained 8. Secondary Minerals: vesicles & cracks are partly filled with sediment and CC 9. Encrustations: thin Mn coating 10. Comment: belongs to aphyric group, maybe more evolved	x	x					GNS	
SO255-DR179-15	1. Rock Type: volcanic, moderately altered 2. Size: 32x26x17cm original size of block W, sample pieces 27x22x16cm, 20x19x13 3. Shape / Angularity: subangular 4. Color of cut surface: greenish-grey 5. Texture / Vesicularity: near aphyric, vesicular 7% up to 10mm, partly filled, vesicles appear compressed 6. Phenocrysts: Fsp <1% up to 2mm, altered 7. Matrix: dense, small needles Fsp? 8. Secondary Minerals: vesicles filled with green-reddish minerals 9. Encrustations: thin Mn coating 10. Comment: belongs to aphyric group, maybe more evolved?	x	x						

Appendix 2 (Station Details and Rock Description)

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR179-16	1. Rock Type: volcanic, slightly altered 2. Size: 18x13x8cm 3. Shape / Angularity: subrounded 4. Color of cut surface: grey slightly brownish 5. Texture / Vesicularity: aphyric, vesicular 3% up to 1mm, partly filled 7. Matrix: fine grained 8. Secondary Minerals: cracks & vesicles partly filled with sediment & Mn 9. Encrustations: thin Mn coating 10. Comment: belongs to aphyric group, more evolved?	x							
SO255-DR179-17	1. Rock Type: volcanic, relatively fresh, aphyric group, andesitic? 2. Size: 28x23x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: grey 5. Texture / Vesicularity: aphyric, non-vesicular, dense 6. Phenocrysts: very few Px <<1% <1mm 7. Matrix: fine grained, dense 8. Secondary Minerals: 10. Comment: more evolved?	x	x						
SO255-DR179-18	1. Rock Type: volcanic, contact of two lava flows, altered chilled margin betweeb two lava horizons, more evolved, rhyolitic ---> altered obsidian 2. Size: 20x16x11cm 3. Shape / Angularity: subangular 4. Color of cut surface: brown - grey 5. Texture / Vesicularity: aphyric lava with 2cm thick chilled margin, brecciated flow top 6. Phenocrysts: aphyric, very few Px <<1% <1mm; Fsp <<1% 1mm; brecciated lava flow, volcanic clasts contain 30% altered Fsp phenocrysts 7. Matrix: aphyric, fine grained, dense 9. Encrustations: Mn coating 10. Comment: thick glassy / perlitic margin up to 2.5cm thick	x	x					GNS	
SO255-DR179-19	1. Rock Type: volcanic, volcaniclastic, contact between lava flowing over reddish volcaniclastic deposit forming glassy contact zone 2. Size: 47x44x23cm original size of block L, sveral large pieces taken 3. Shape / Angularity: subangular block L 4. Color of cut surface: lava grey; breccia red-brown 5. Texture / Vesicularity: porphyric lava weakly vesicular; volcaniclatic large and small volcanic clasts, strongly vesicular 6. Phenocrysts: Fsp 20% <3mm; Px 10% <3mm, some Px/Fsp intergrowth, clasts in breccia contain Fsp 7. Matrix: lava fine grained, volcaniclastic brecciated poorly sorted 9. Encrustations: 5mm thick glassy chilled margin along contact bwtween lava and volcaniclastic unit 10. Comment: TS of porhyric lava and glassy contact zone, GC of lava	2x	x					GNS	
SO255-DR179-20	1. Rock Type: volcaniclastic, separated single large, angular lava clast from matrix 2. Size: clast 13x8x7cm; block I 39x31x20cm, matric sample 22x17x13cm 3. Shape / Angularity: subangular, clast angular 4. Color of cut surface: beige brown matrix, lava clast grey 5. Texture / Vesicularity: aphyric lava dense 6. Phenocrysts: aphyric, very few Px <<1% <1mm; Fsp <1% 2mm 7. Matrix: aphyric, fine grained, dense 8. Secondary Minerals: greenish patches within matrix	x	x						

SAMPLE #	SAMPLE DESCRIPTION	TS	CHEM	Ar/Ar	GL/MIN	SED	REF	NOTES	PICTURE
SO255-DR179-21	1. Rock Type: volcaniclastic 2. Size: clast 57x40x17cm original size of block V; sample pieces 27x19x10cm, 19x20x14cm, 18x17x10cm 3. Shape / Angularity: subangular block V 4. Color of cut surface: red-brown with brown grey to dark black volcanic clasts 5. Texture / Vesicularity: brecciated with porphyric clasts, weakly vesicular, clasts 2mm to 2cm ø 6. Phenocrysts: clasts contain Px and Fsp 7. Matrix: brecciated, poorly sorted 8. Secondary Minerals: greenish patches within matrix 10. Comment: sample may contain larger glass shards to be detected by slicing up pieces. -21 to -23 are brecciated volcaniclastics							GNS?	
SO255-DR179-22	1. Rock Type: volcaniclastic, one large ø4cm clast within matrix 2. Size: 18x12x9cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown 5. Texture / Vesicularity: brecciated with volcanic & sediment clasts of variable size, weakly to moderate vesicular 6. Phenocrysts: clasts contain phenocrysts 7. Matrix: brecciated, poorly sorted 8. Secondary Minerals: red volcanic clasts								
SO255-DR179-23	1. Rock Type: volcaniclastic 2. Size: clast 13x12x10cm 3. Shape / Angularity: subrounded 4. Color of cut surface: brown with grey clasts 5. Texture / Vesicularity: brecciated with volcanic clasts, porphyric weakly vesicular 6. Phenocrysts: clasts Fsp 20% <2mm 7. Matrix: brecciated, poorly sorted 8. Secondary Minerals: red volcanic clasts								

SO255-DR180

Description of Location and Structure: Volcanic Front, SONNE Volcano, ridge emanating towards SW from volcano, NE slope from base to top.

Dredge on bottom UTC 08/04/17 22:53hrs, lat 34 4.79'S, long 179 28,01'E, depth 2683m
Dredge off bottom UTC 08/04/17 23:57hrs, lat 34 5,03'S, long 179 28,38'E, depth 2439m
total volume: empty

Abbreviations in Table Header:

TS: thin section billet
CHEM: chemistry slab to prepare materials for geochemical analysis
Ar/Ar: estimate of sample quality for 40Ar/39Ar dating
GL/MIN: potential glass and / or mineral separates
SED: sediment
REF: reference sample for immediate transport to home institution after cruise

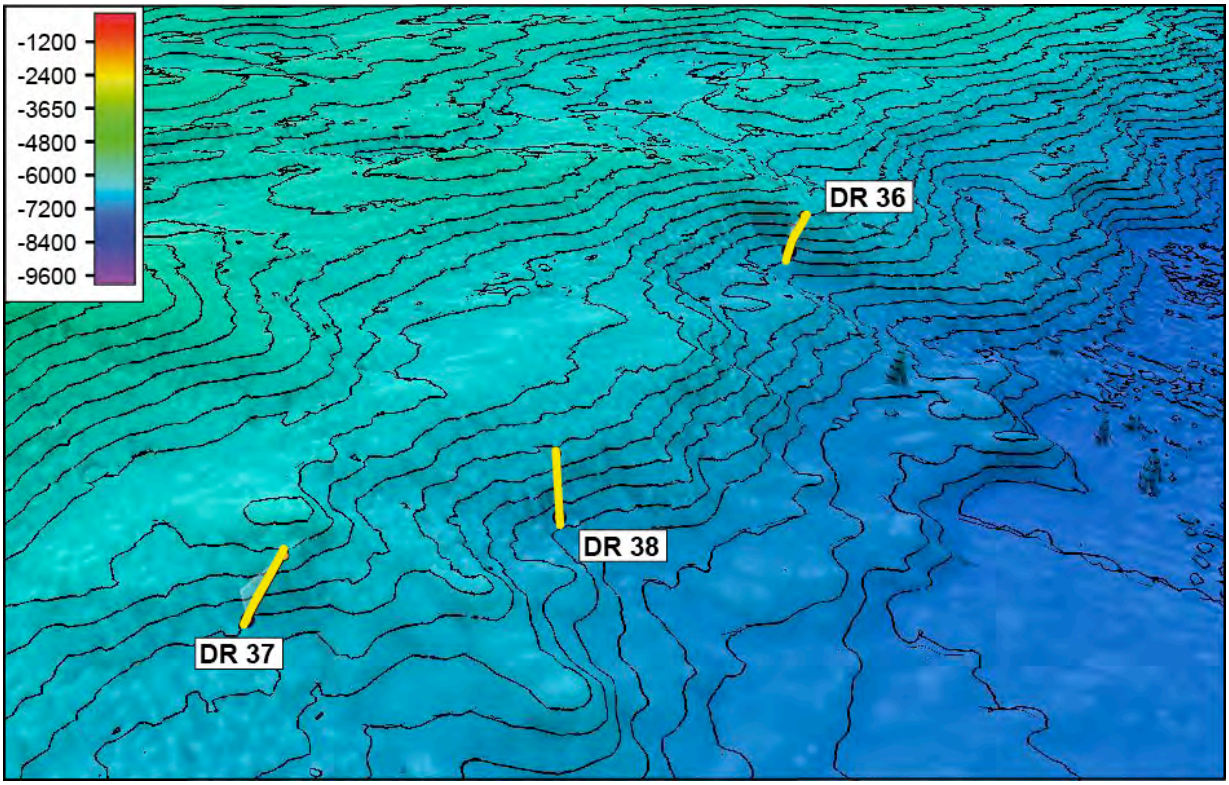
Abbreviations for Minerals and Materials:

Fsp: feldspar
Plg: plagioclase
Ol: olivine
Px: pyroxene
CPx: clinopyroxene
Opx: orthopyroxene
Cc: clacite
Mn: manganese
Qtz: Quartz
MI: Melt Inclusions
GM: Groundmass
MT: Magnetite
ZR: Zircon

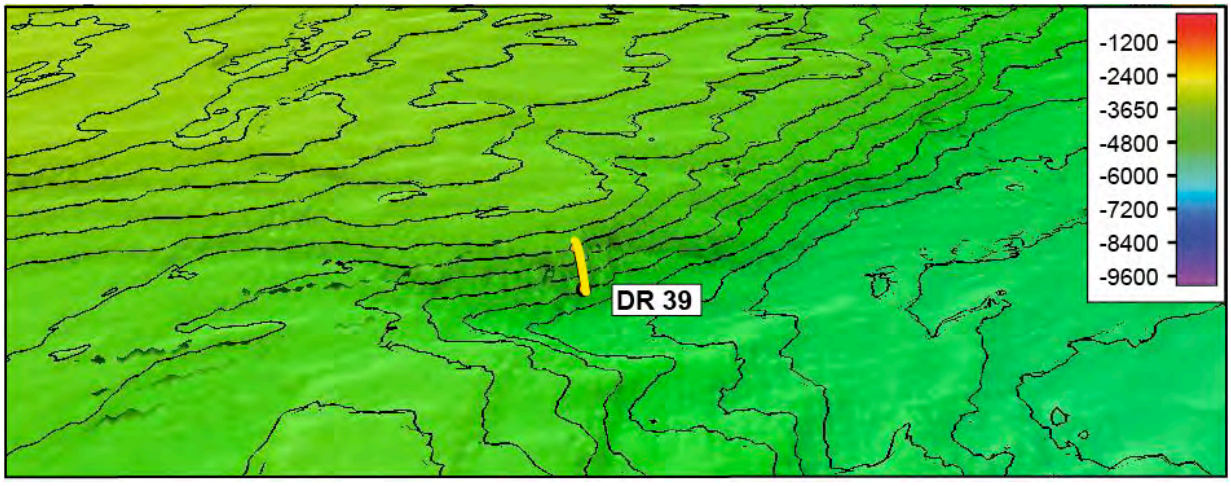
Appendix III (3D Maps of SO255 Dredge Tracks)

The 3D-maps shown in this appendix are based on multi-beam data recorded on SO255 and on a comprehensive data set supplied by the Institute of Geological and Nuclear Sciences (GNS). Stereo exaggeration is 2x for all maps, the interval of contour lines is 100 m.
The order of the maps and dredge tracks, respectively, corresponds to the dredge site descriptions in chapter 7.2.

(A) Dredge sites in the Kermadec Fore Arc

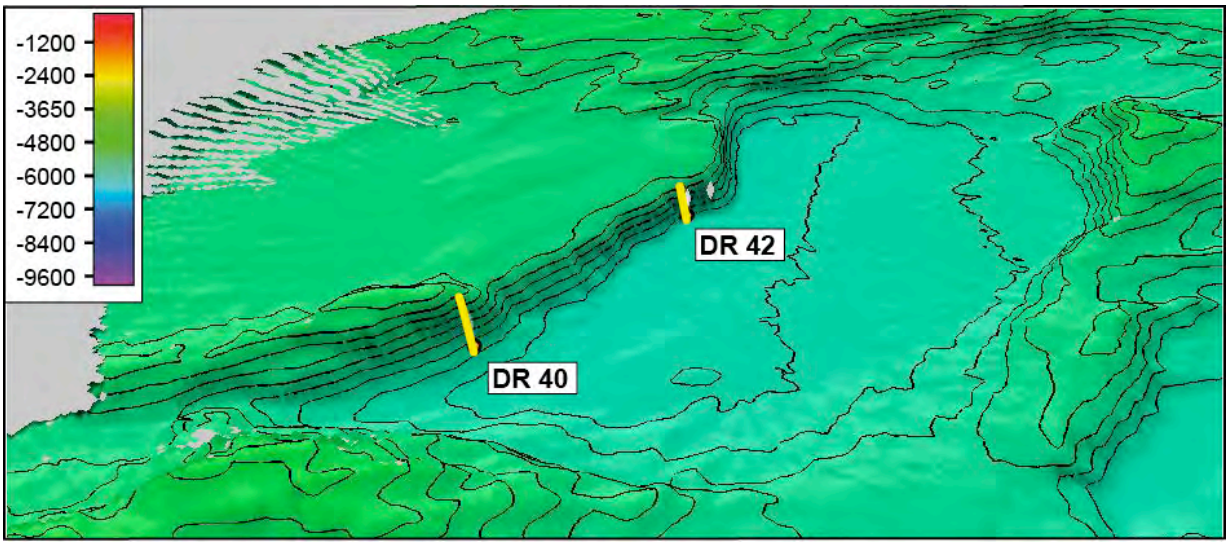


DR36 - 37 at the lowermost fore arc slope in the southern part of the fore arc profile sampled on SO255 (view from SE to NW).

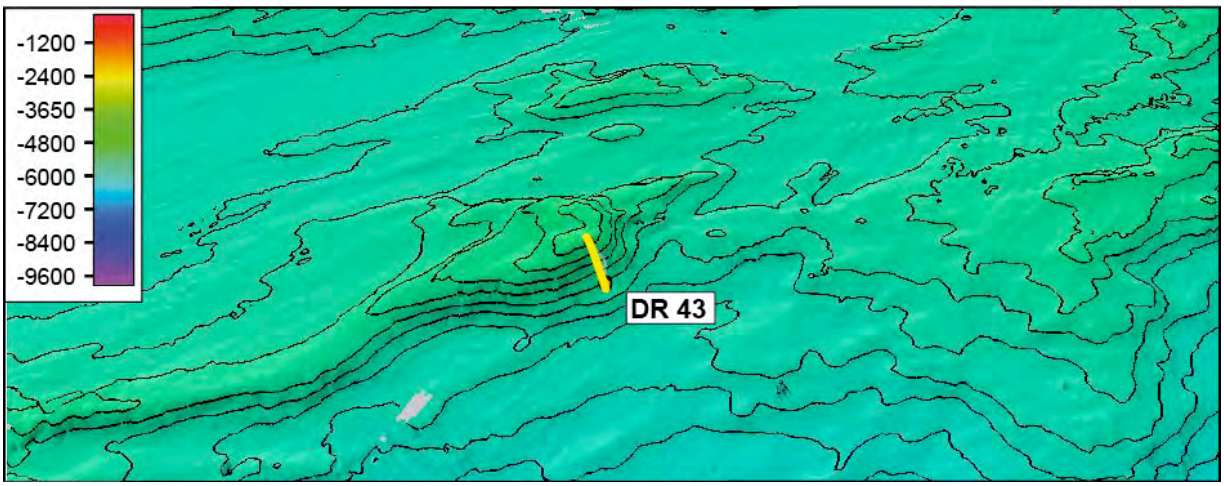


DR39 at step / scarp within the middle fore arc slope (view from SE to NW).

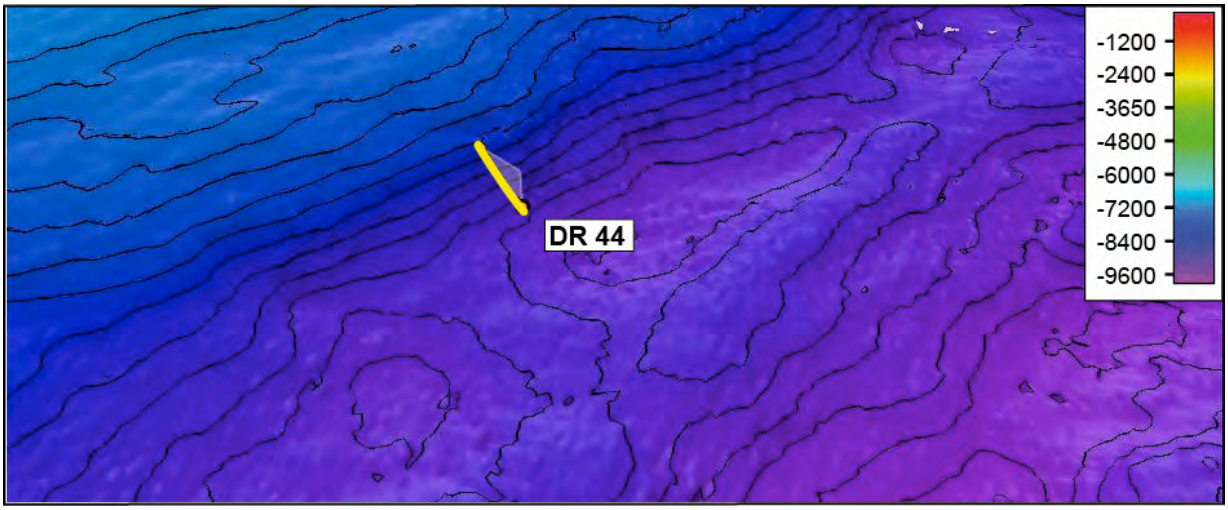
Appendix III (3D Maps of SO255 Dredge Tracks)



DR40 and DR42 along the western margin of a basin within the middle fore arc slope (view from SE to NW).

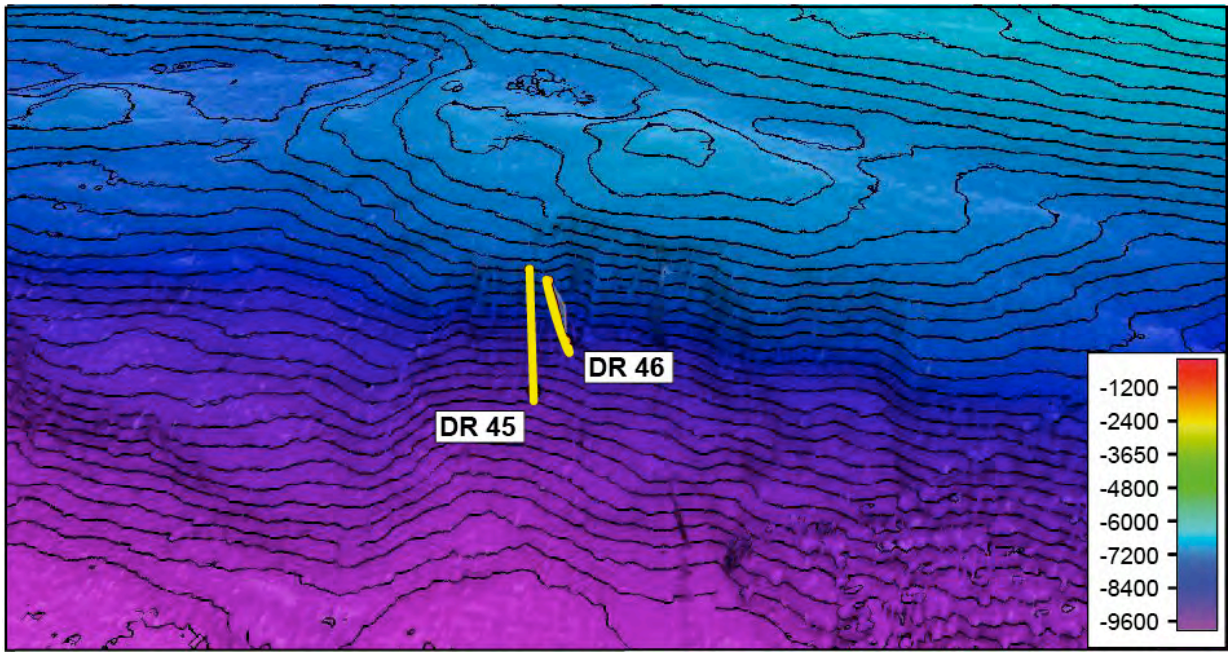


DR43 at the middle arc slope (view from SE to NW).

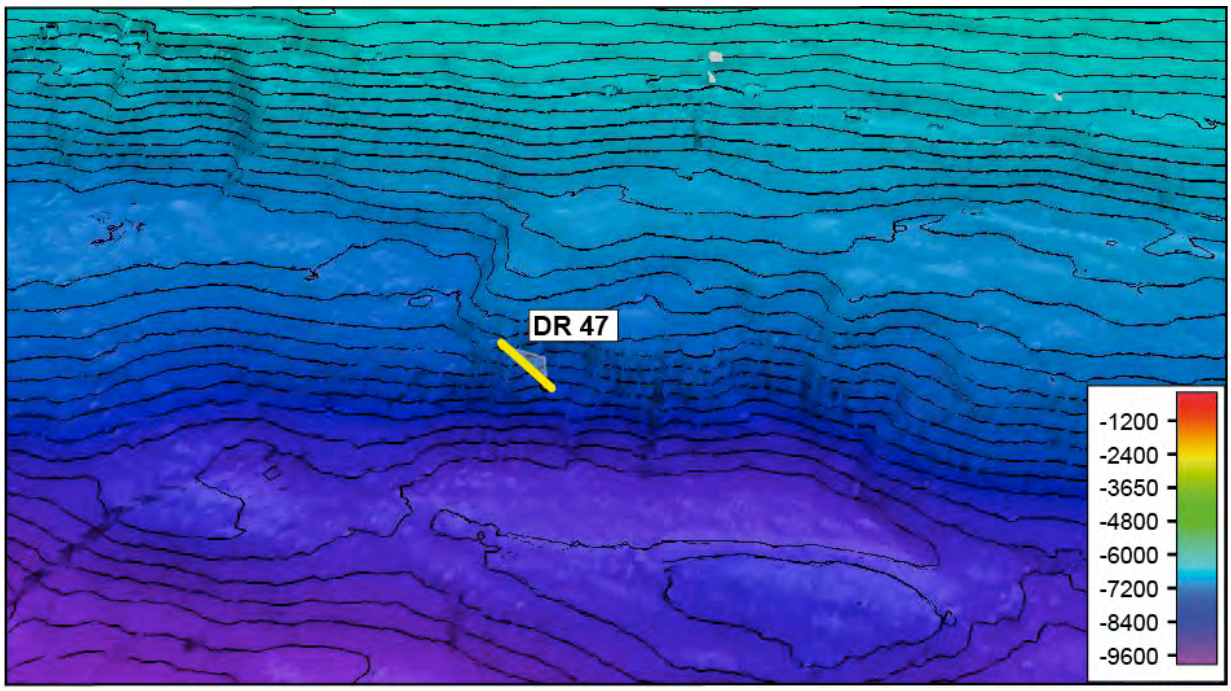


DR44 at the lower arc slope (view from SE to NW).

Appendix III (3D Maps of SO255 Dredge Tracks)

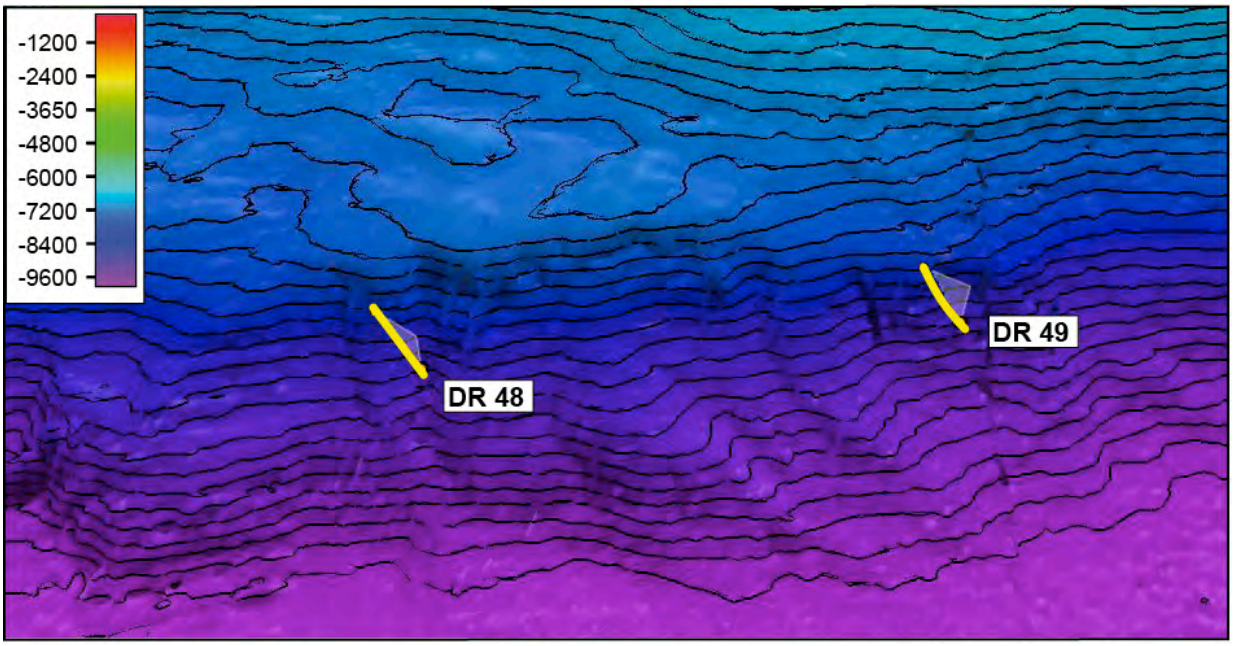


DR45 and 46 at the lowermost Kermadec trench wall in the central part of the fore arc profile (view from ESE to WNW).

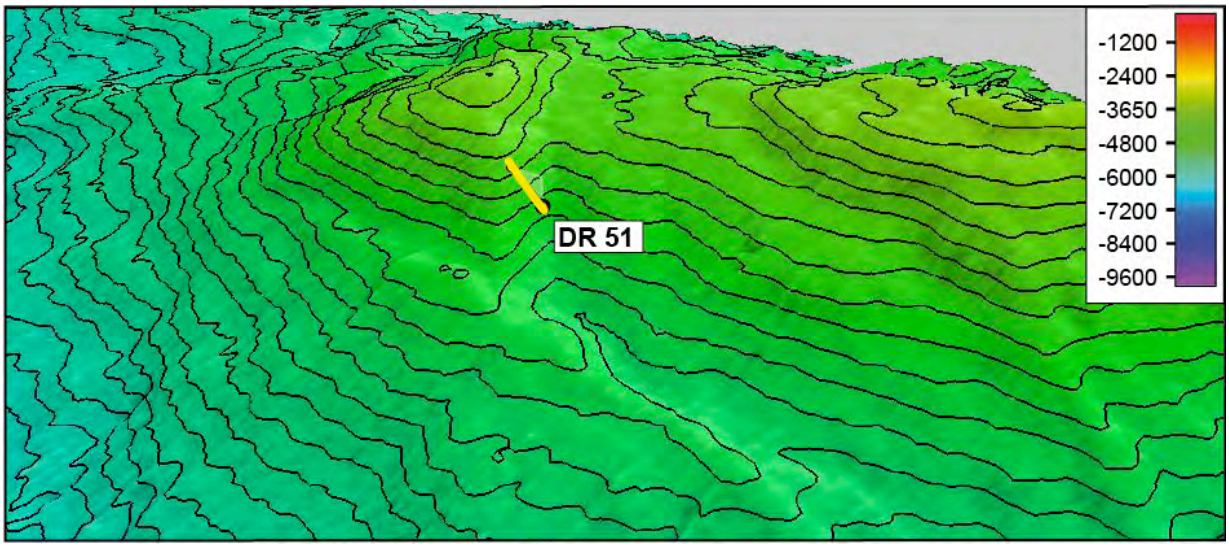


DR47 at lowermost Kermadec Fore Arc slope (view from ESE to WNW).

Appendix III (3D Maps of SO255 Dredge Tracks)

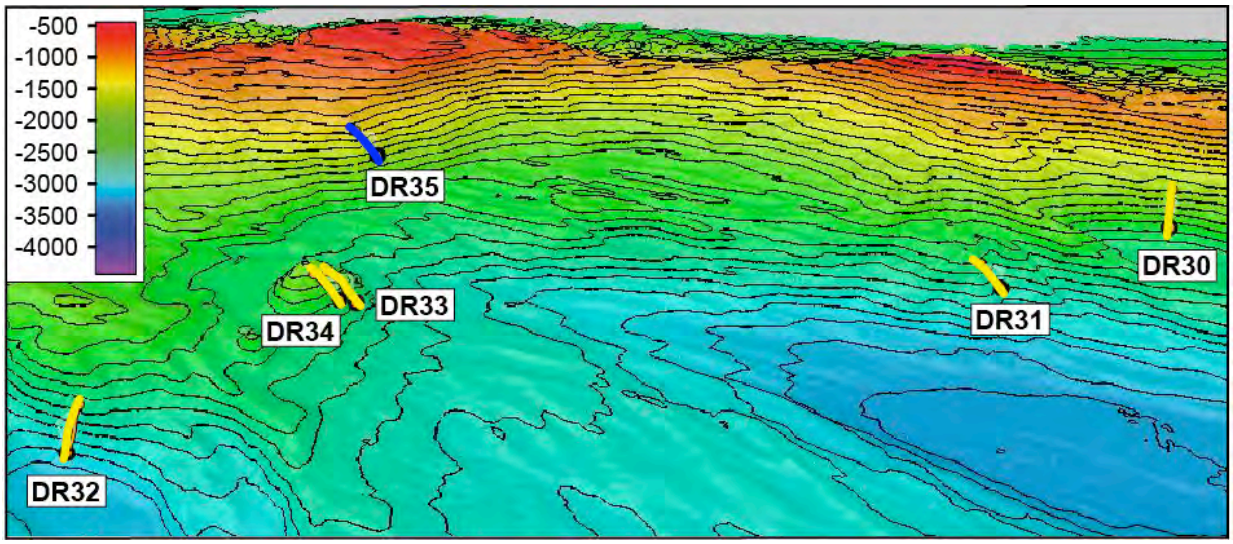


DR48 and 49 at the lower fore arc at the northern end of the fore arc profile sampled by SO255 (view from ESE to WNW).

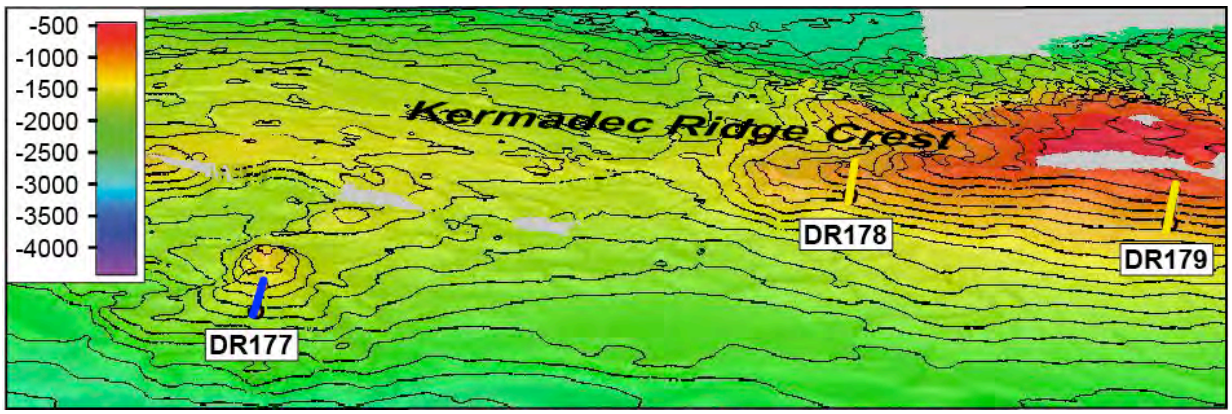


DR51 at a large seamount within the fore arc slope (view from ENE to WSW).

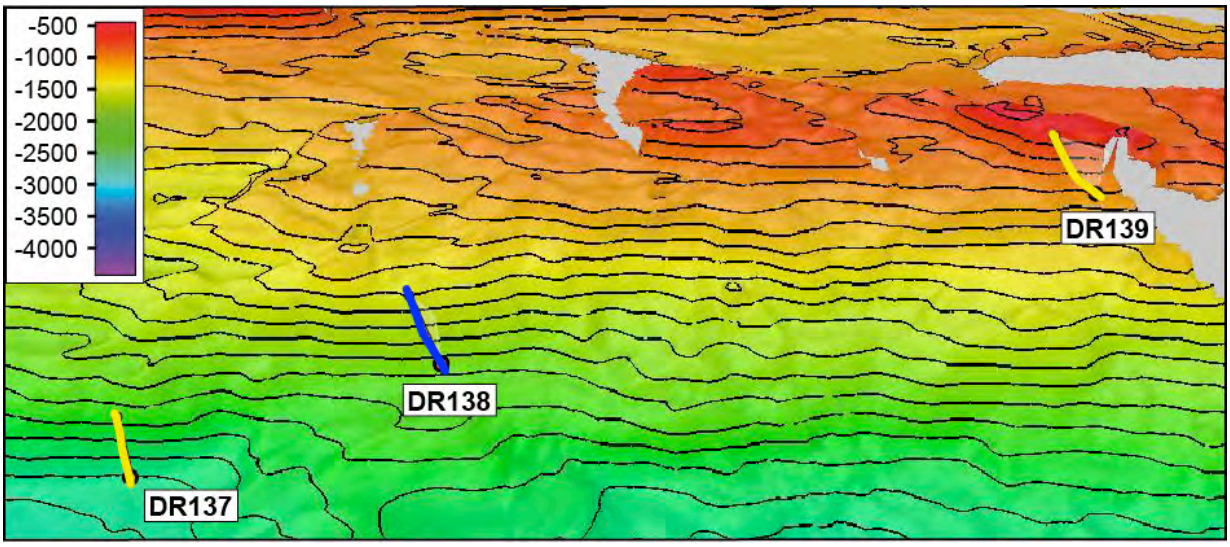
(B) Dredge sites at the Kermadec Ridge



DR30 - 35 are the southernmost stations at the Kermadec Ridge. They are located at its western flank and at a small cone on the ridge (view from WNW to ESE).

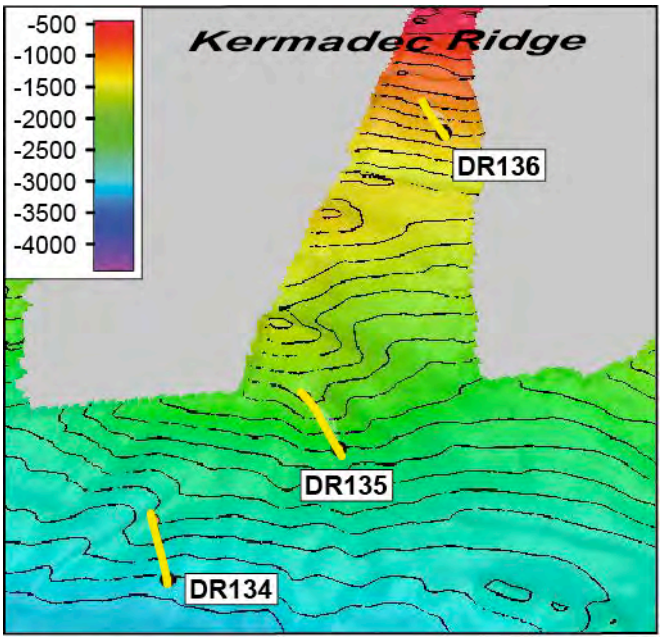


DR178 and 179 at the upper west-facing flank of the Kermadec Ridge and DR178 at a small cone on the ridge flank (view from NW to SE).

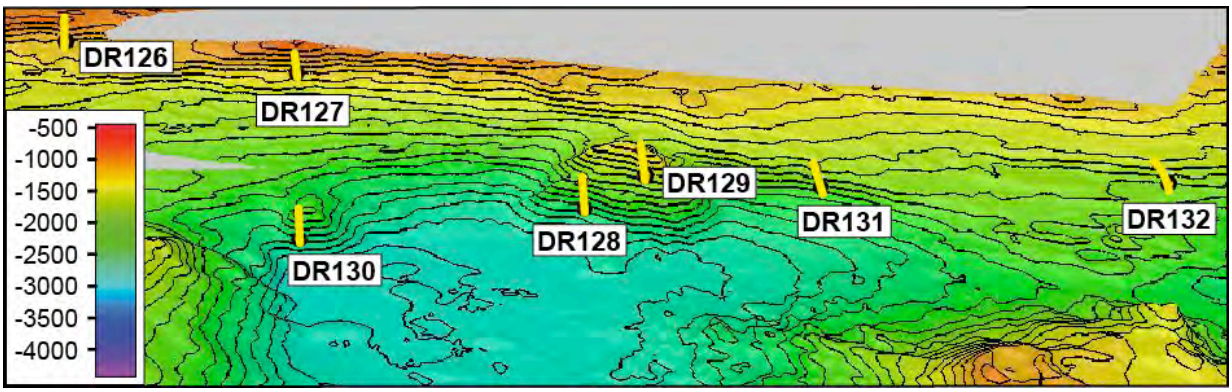


DR137 - 139 at the central portion of the Kermadec Ridge (view from WNW to ESE).

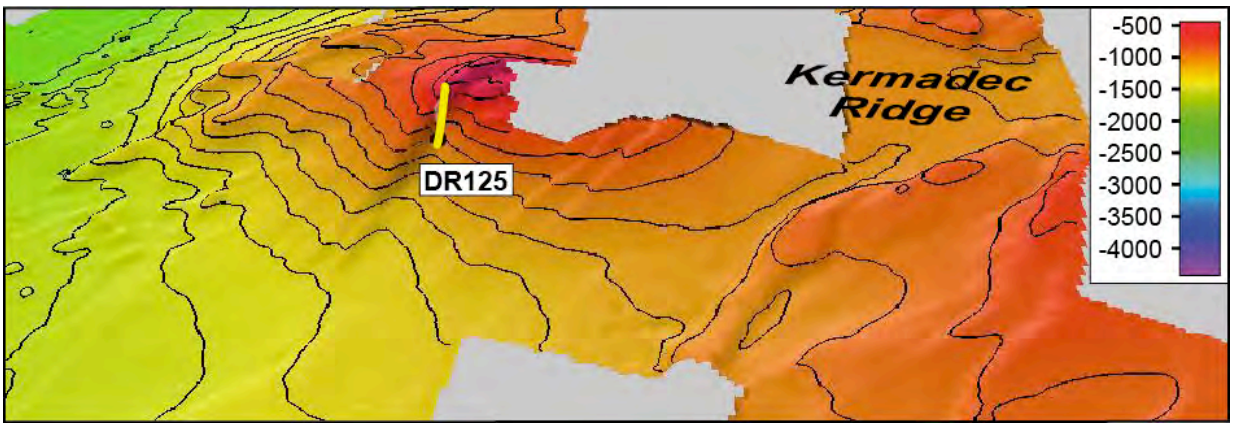
Appendix III (3D Maps of SO255 Dredge Tracks)



DR134 - 136 along a profile from the base to the top of the western flank of Kermadec Ridge (view from WNW to ESE).

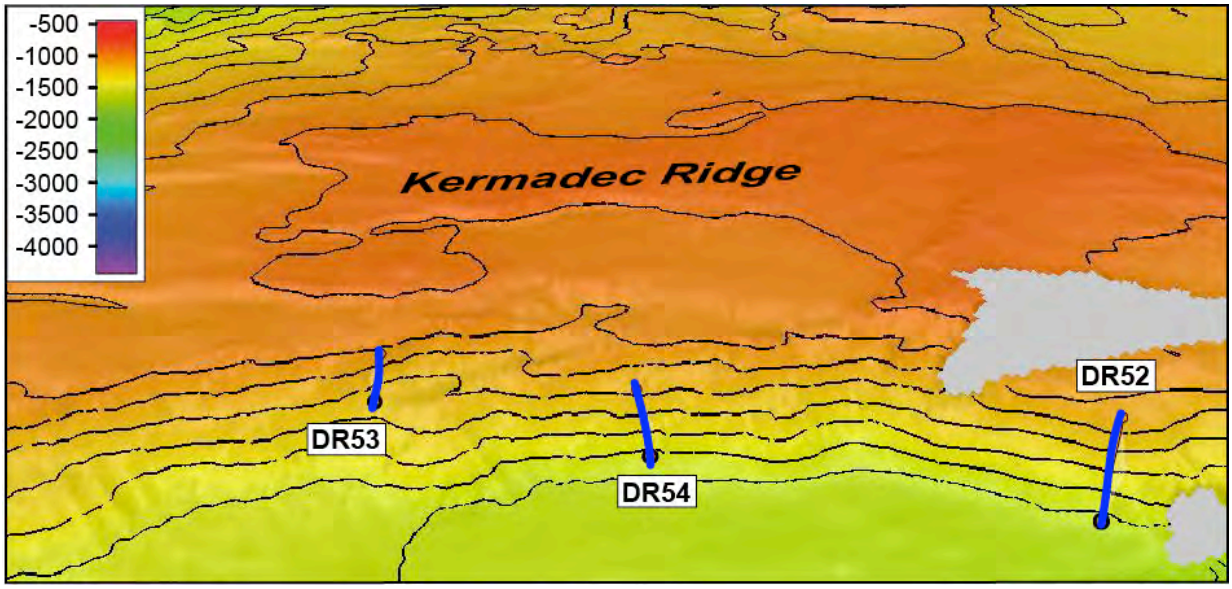


DR126 - 132 at the central part of the Kermadec Ridge sampling its western flank as well as volcanic edifices on the ridge (view from WNW to ESE).

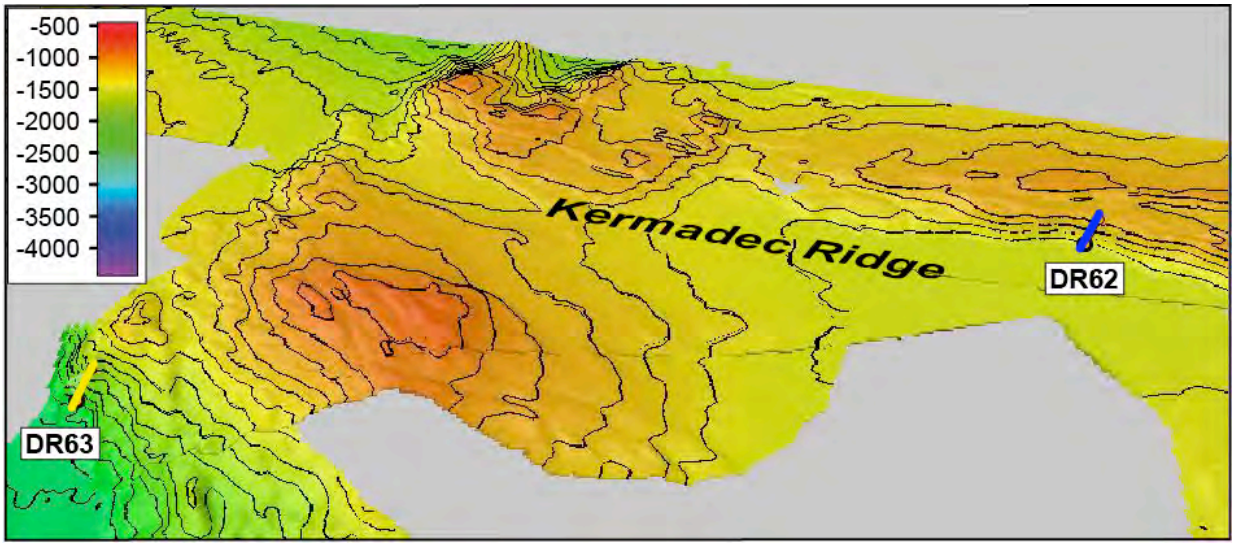


DR125 at a flat volcanic feature at the intersection of the Kermadec Ridge with the volcanic front (view from S to N).

Appendix III (3D Maps of SO255 Dredge Tracks)

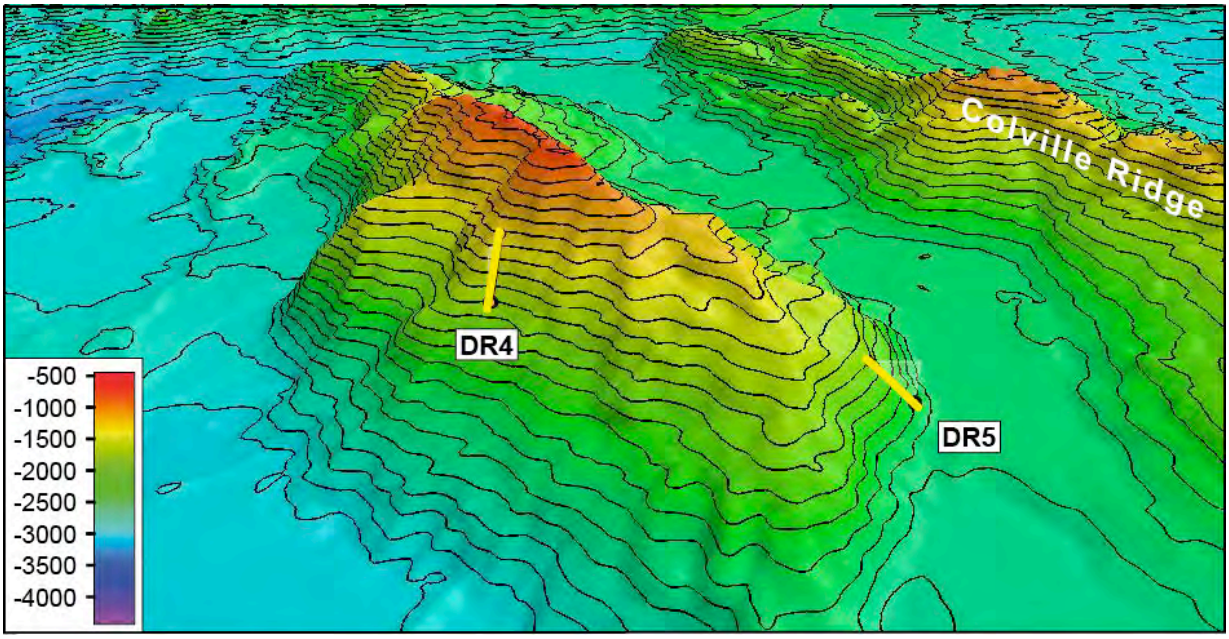


DR52 - 54 at the west-facing slope of the Kermadec Ridge in its northern portion north of Macauley Island (view from NW to SE).

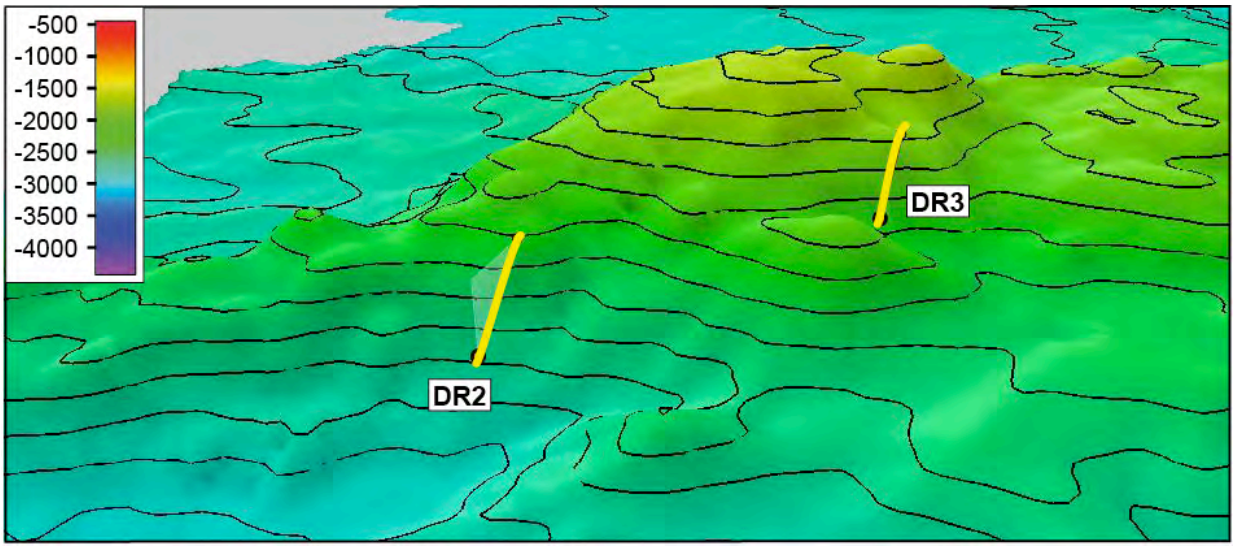


DR62 and 63 are the northernmost stations sampled on cruise SO255 at the western flank of the Kermadec Ridge (view from W to E).

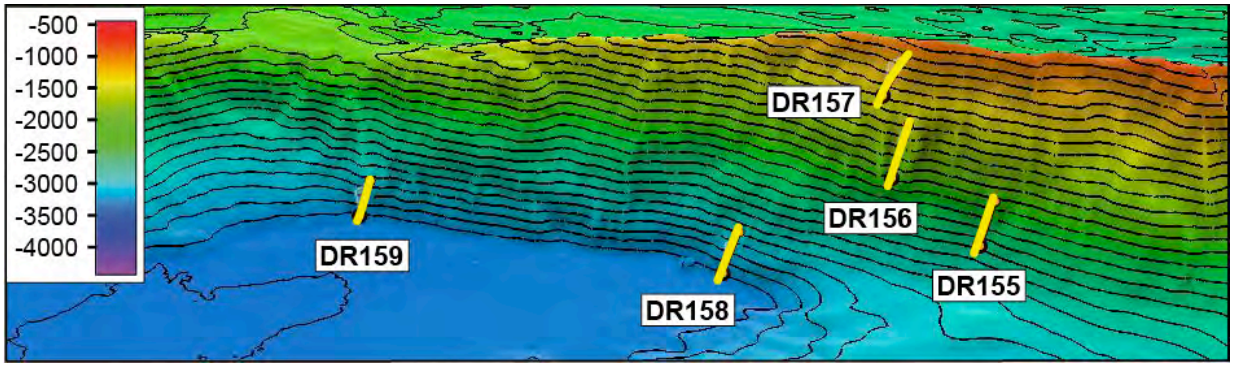
(C) Dredge sites at the Colville Ridge



DR4 and 5 at a rifted (?) ridge east of Colville Ridge (view from NE to SW).

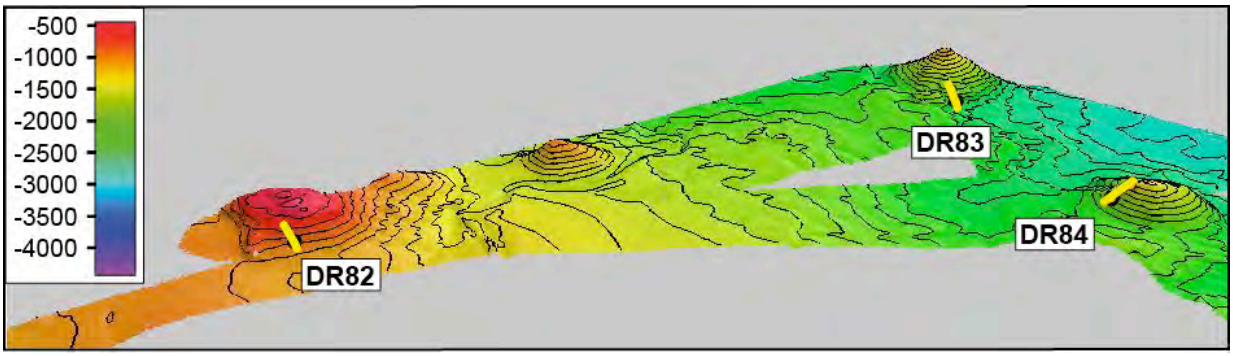


DR 2 and 3 west of the Colville Ridge along a NW-SE striking ridge emanating from Colville Ridge (view from SSW to NNE).

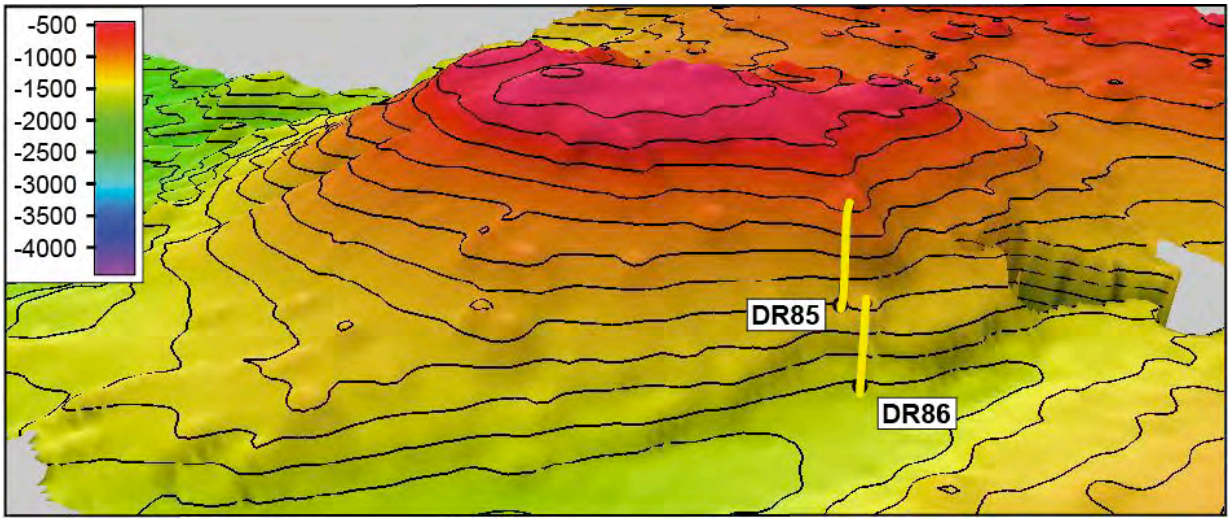


DR155 - 159 at a steep, west-facing cliff at the Colville Ridge (view from SE to NW).

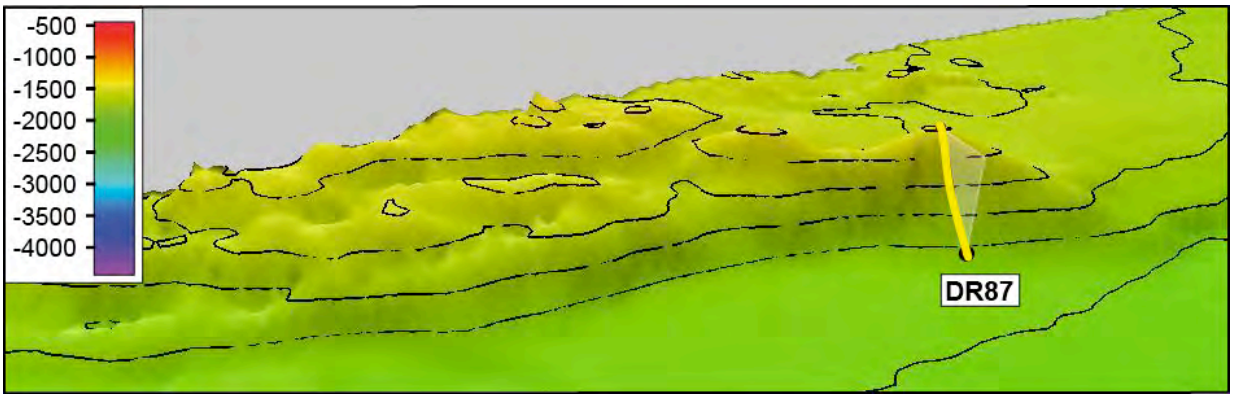
Appendix III (3D Maps of SO255 Dredge Tracks)



DR82 - 84 at circular shaped seamounts on the northern portion of Colville Ridge working area (view from ENE to WSW).

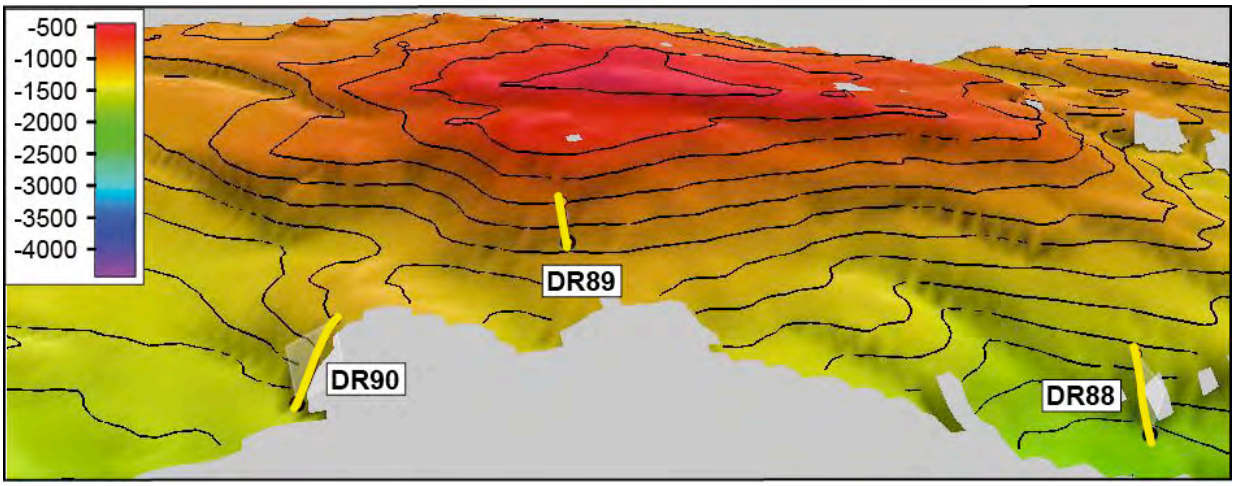


DR85 and 86 at the western margin of the Colville Ridge (view from SSE to NNW).

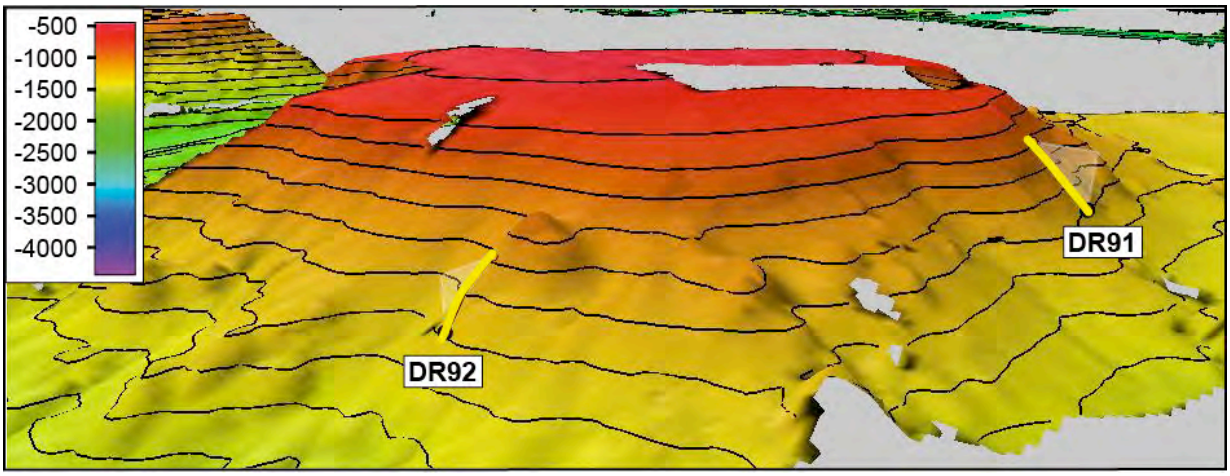


DR87 at the east-facing flank of Colville Ridge between 30°S to 29°S (view from SE to NW).

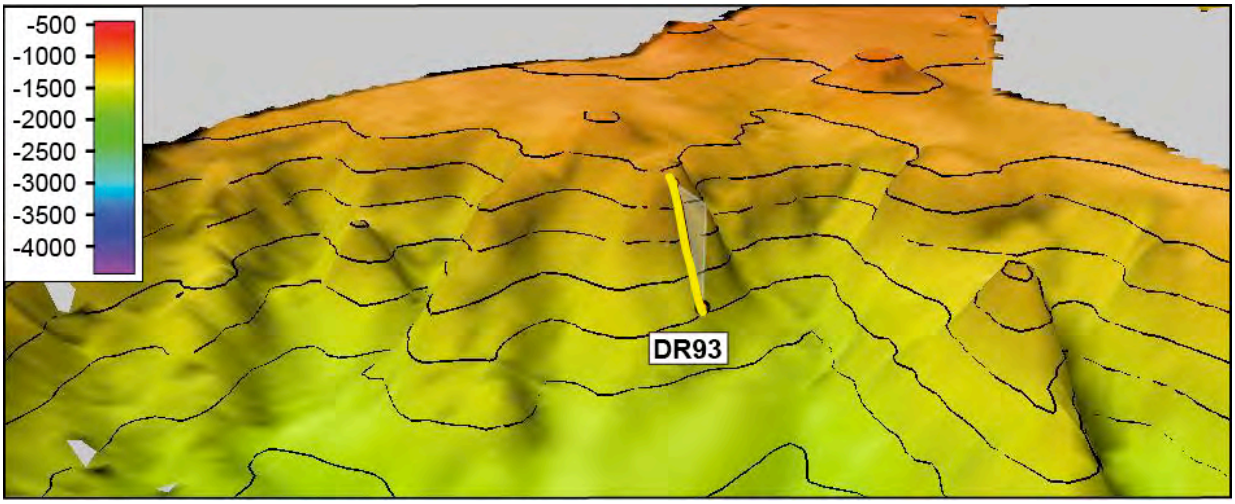
Appendix III (3D Maps of SO255 Dredge Tracks)



DR88 - 90 at the east-facing flank of Colville Ridge between 30°S to 29°S (view from ESE to WNW).

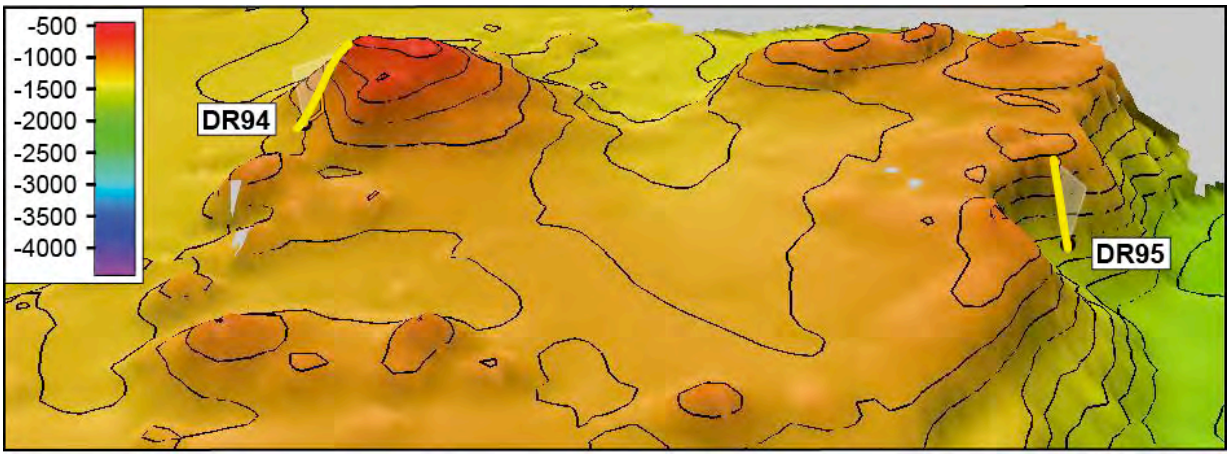


DR91 and 92 at a large guyot-type seamount west of the Colville Ridge (view from SW to NE).

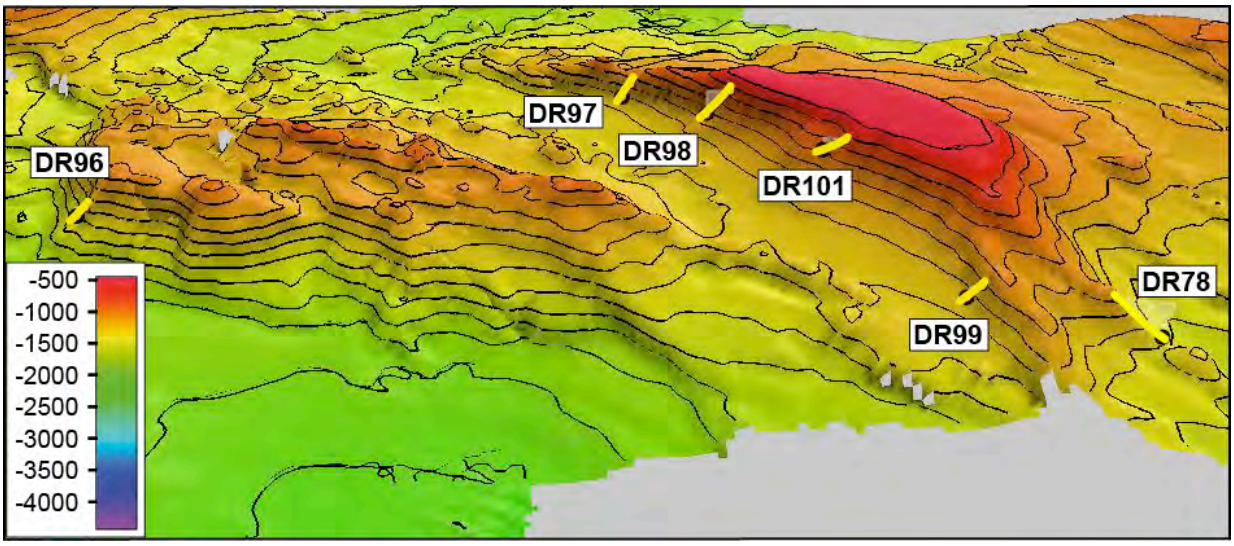


DR93 at the western flank of the northern portion of the Colville Ridge (view from WSW to ENE).

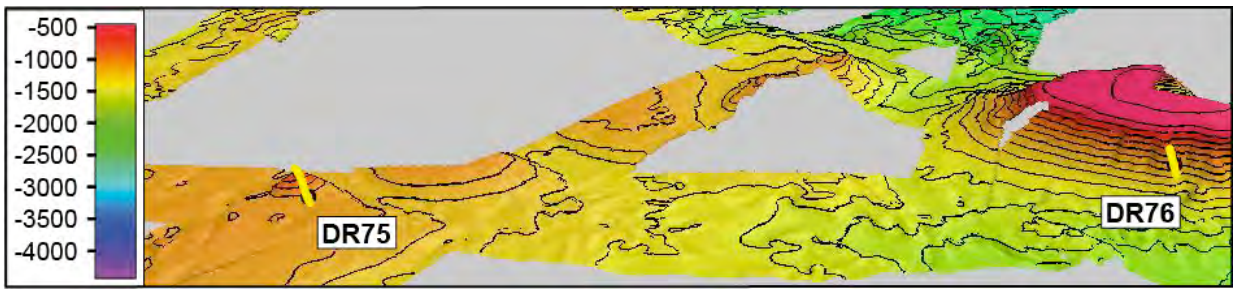
Appendix III (3D Maps of SO255 Dredge Tracks)



DR94 and 95 at the eastern flank of the northern portion of Colville Ridge (view from SSE to NNW).

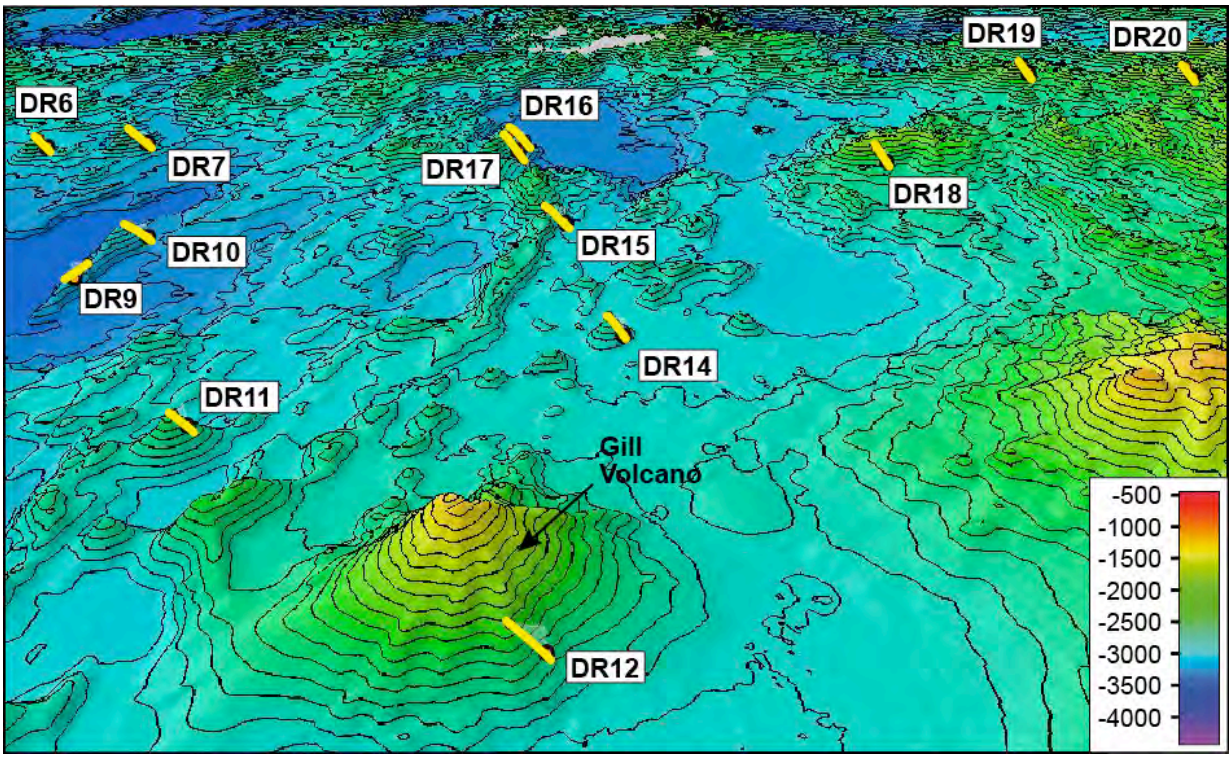


DR78 and DR96 - 101 at a fault scarp and neighboring features at the Colville Ridge (view from E to W).

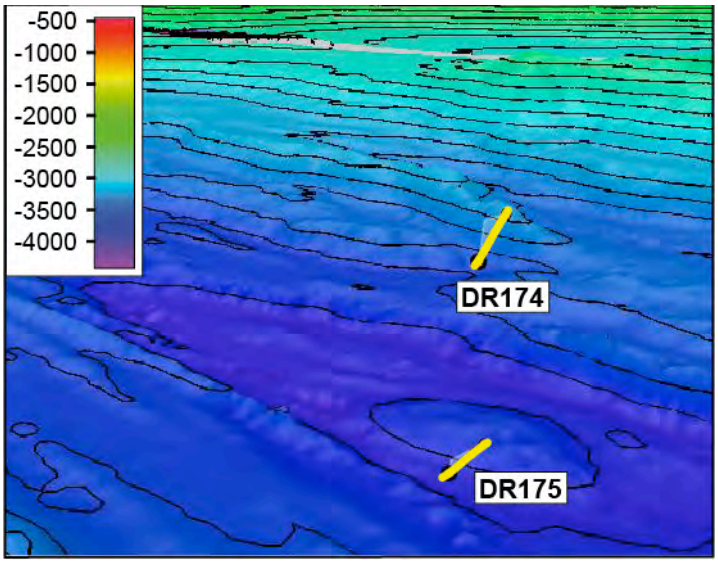


DR75 at a small cone and DR76 at a guyot represent the two northernmost SO255 sampling stations in the Colville Ridge area.

(D) Dredge sites in the Havre Trough

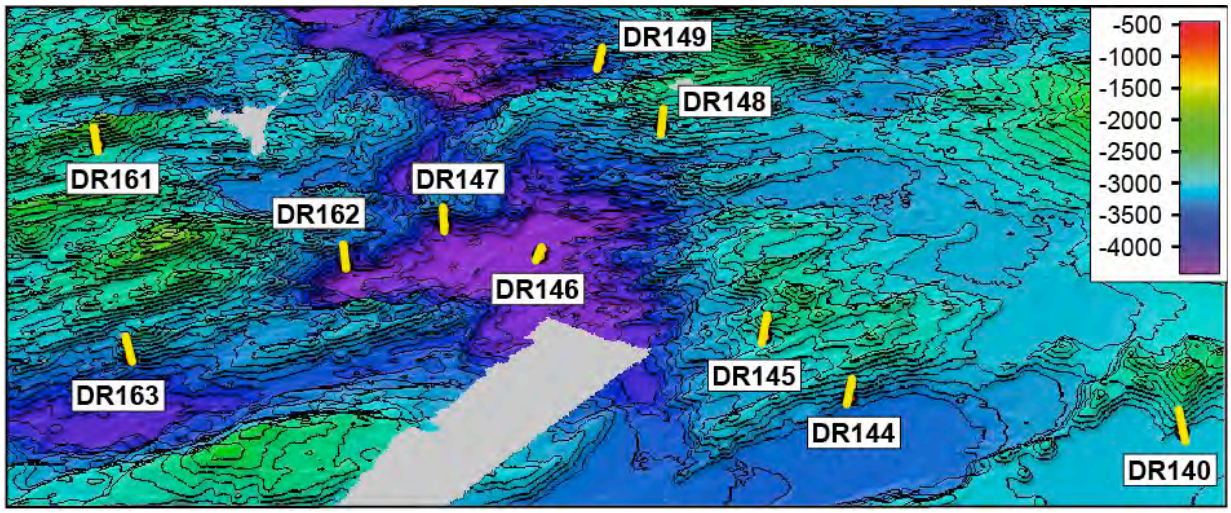


DR6 - 20 along a profile 1 across the Havre Trough at c. 34°05´- 34°30´S (view from SW to NE).

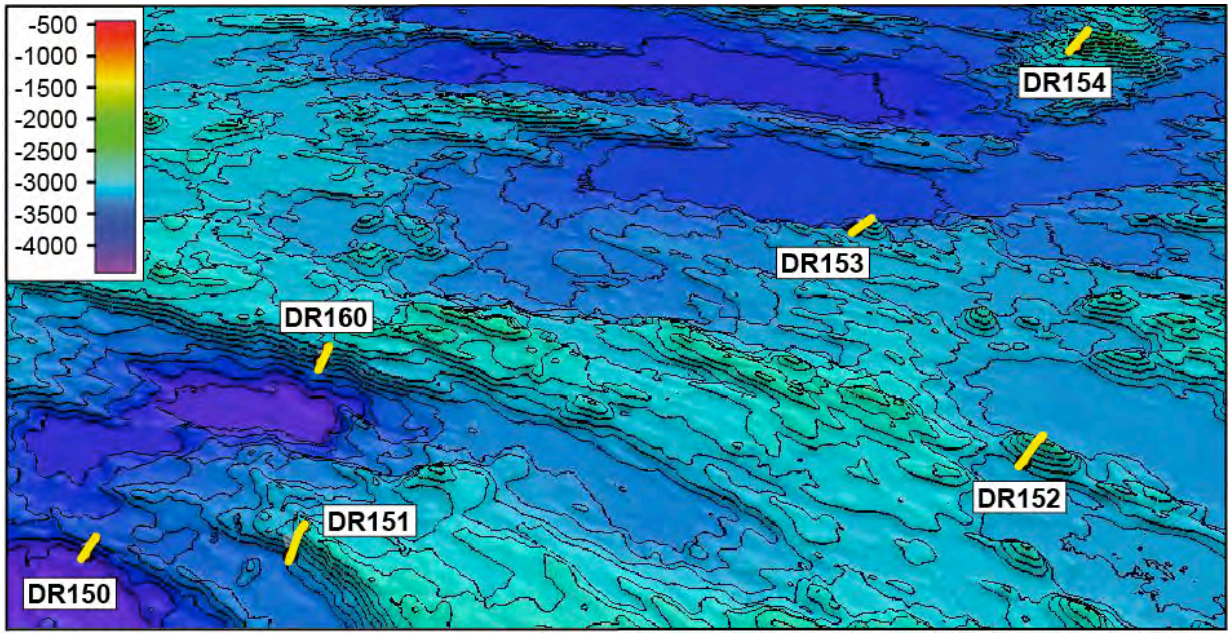


DR174 and 175 in a deep basin southwest of Ngatoroirangi Volcano (view from WNW to ESE).

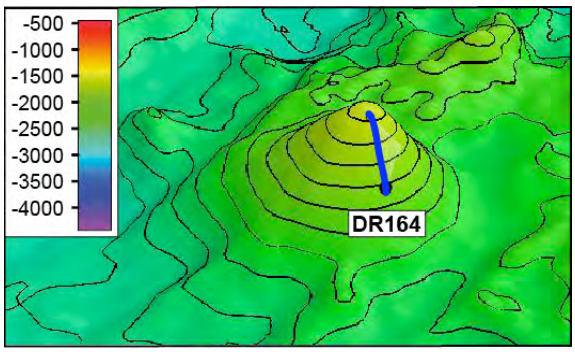
Appendix III (3D Maps of SO255 Dredge Tracks)



DR140, 144 - 149 and 161 - 163 at ridges and a deep basin along profile 2 across the Havre Trough (view from SSE to NNW).

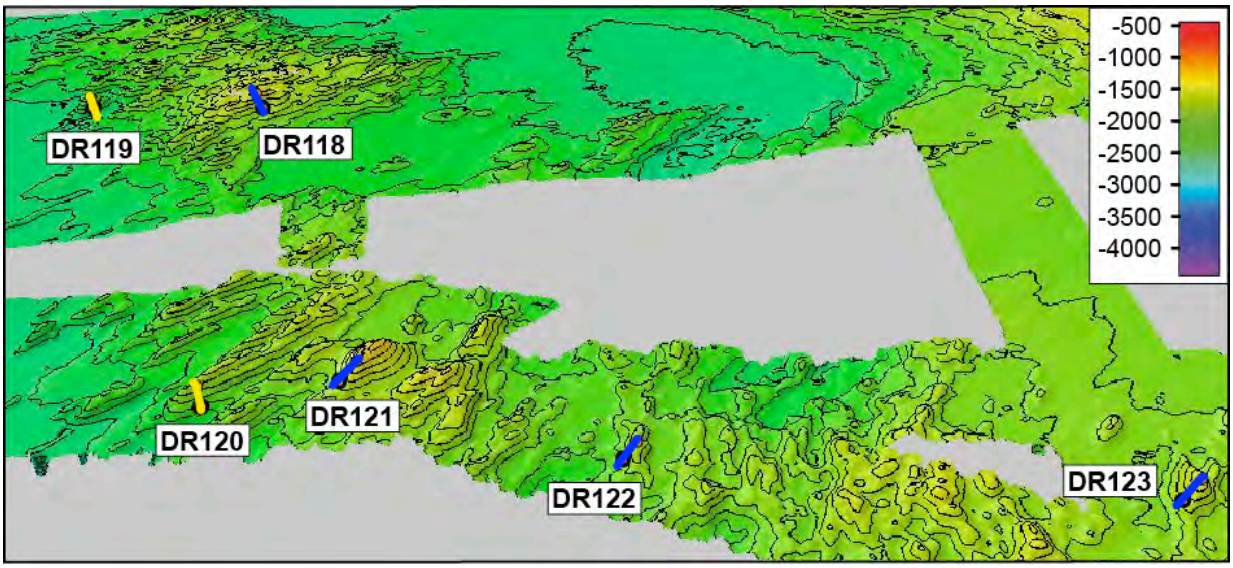


DR150 - 154 and 160 at ridges, cones and flanks of deep basins along profile 2 across the Havre Trough (view from ESE to WNW).

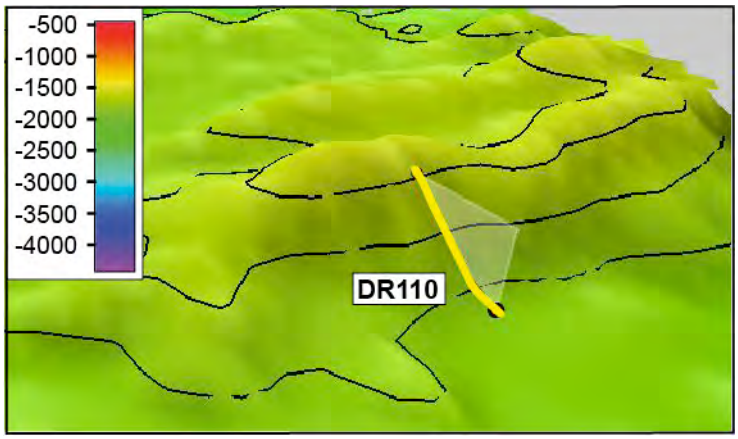


DR164 and 168 at circular cones along profile 2 (view from NNE to SSW for DR164 and from E to W for DR168).

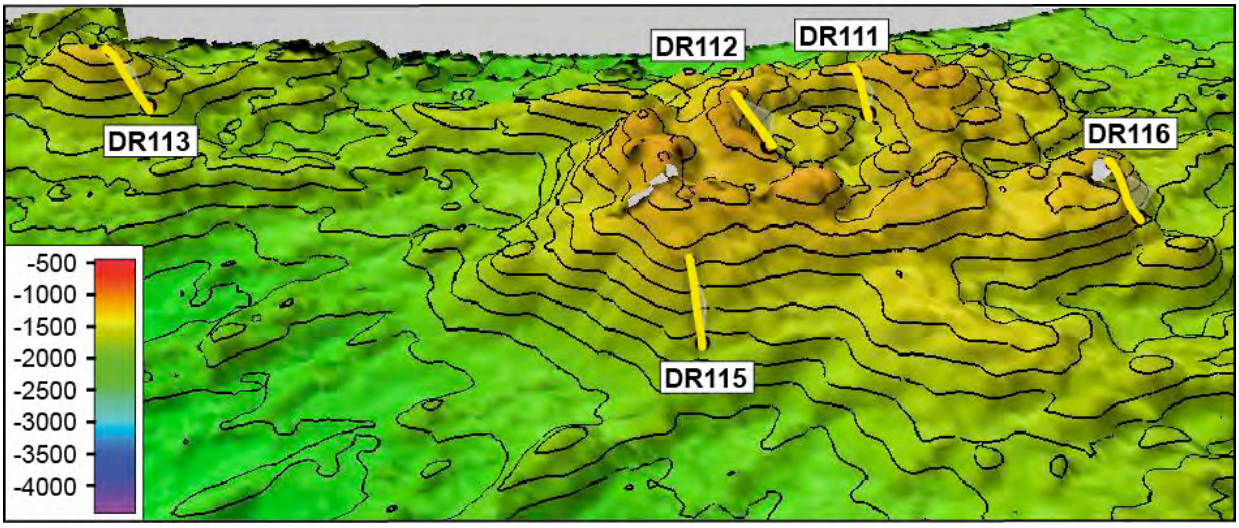
Appendix III (3D Maps of SO255 Dredge Tracks)



DR118 - 123 along profile 3 near the boundary of the deep southern Havre Trough to the northern, shallower part of the trough (view from SW to NE).

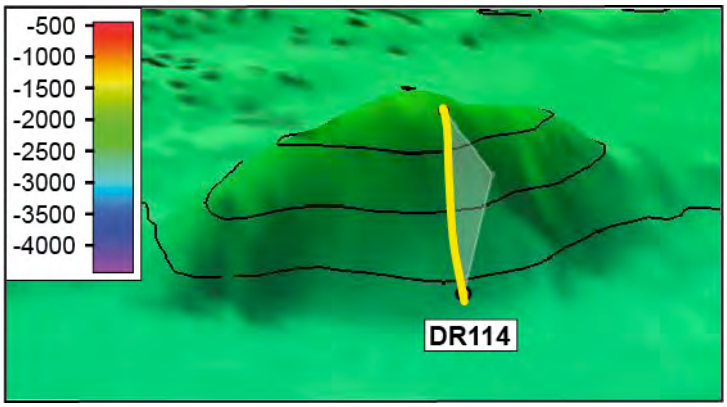


DR110 at a small ridge-like structure represents the easternmost sampling site of profile 4 across the Havre Trough (view from S to N).

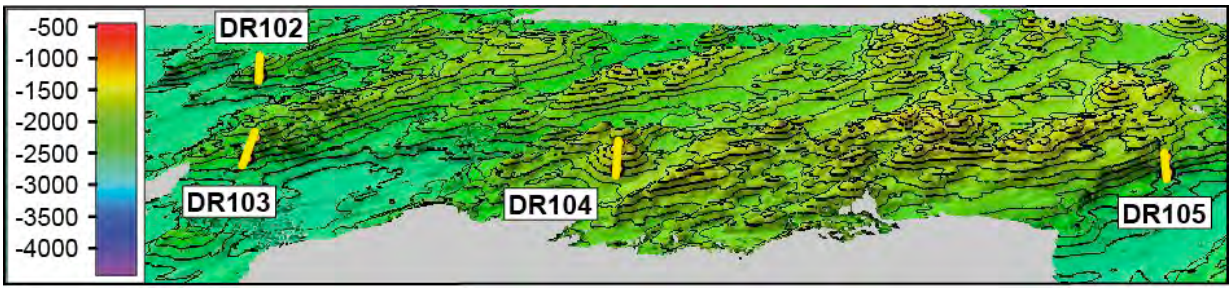


DR111, 112, 115, and 116 at a newly discovered caldera volcano in the center of the Havre Trough and DR133 at a nearby volcanic cone on profile 4 (view from SSE to NNW).

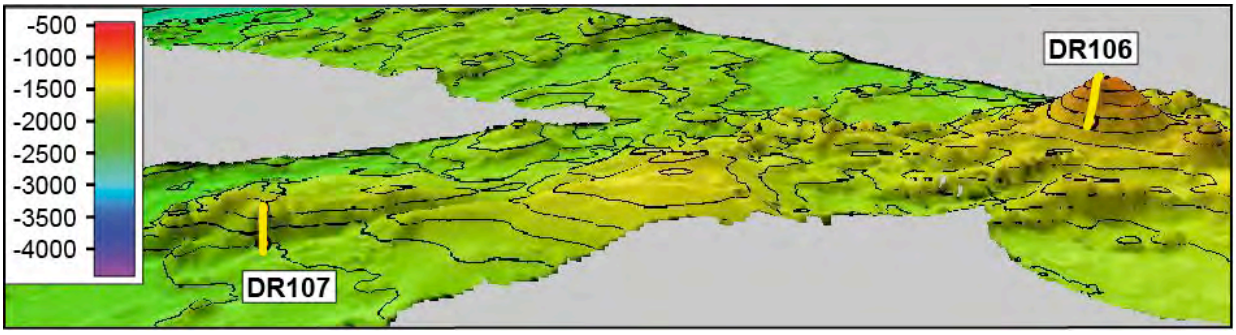
Appendix III (3D Maps of SO255 Dredge Tracks)



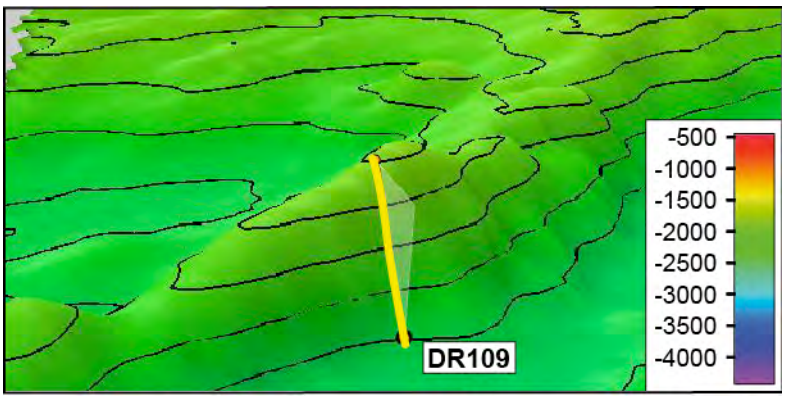
DR114 at a small cone structure represents the westernmost sampling site of the short profile 4 (view from S to N).



DR102 - 105 at cones, ridges and a fault scarp along the northwestern portion of profile 5 (view from S to N).

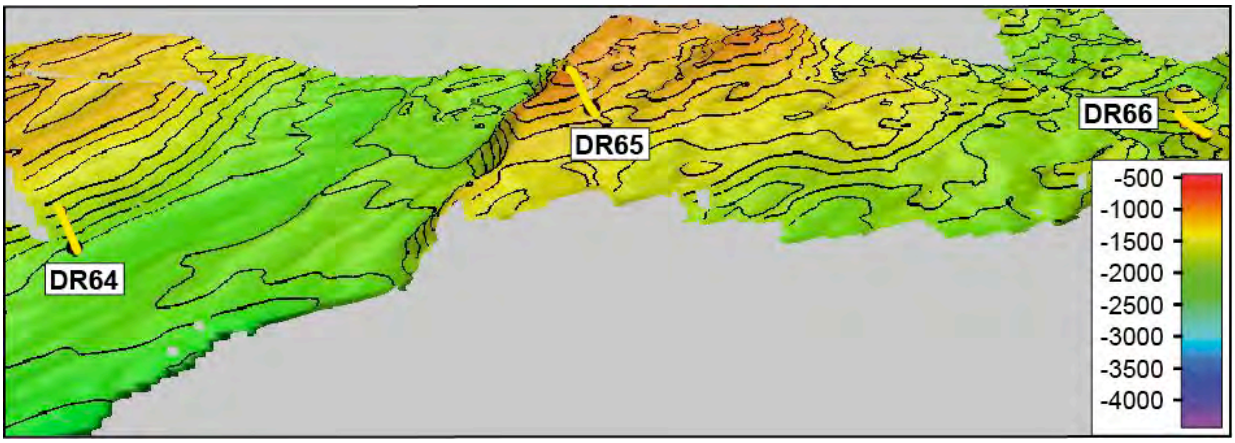


DR 106 and 107 at a ridge and a cone in the southeastern section of profile 5 (view from S to N).

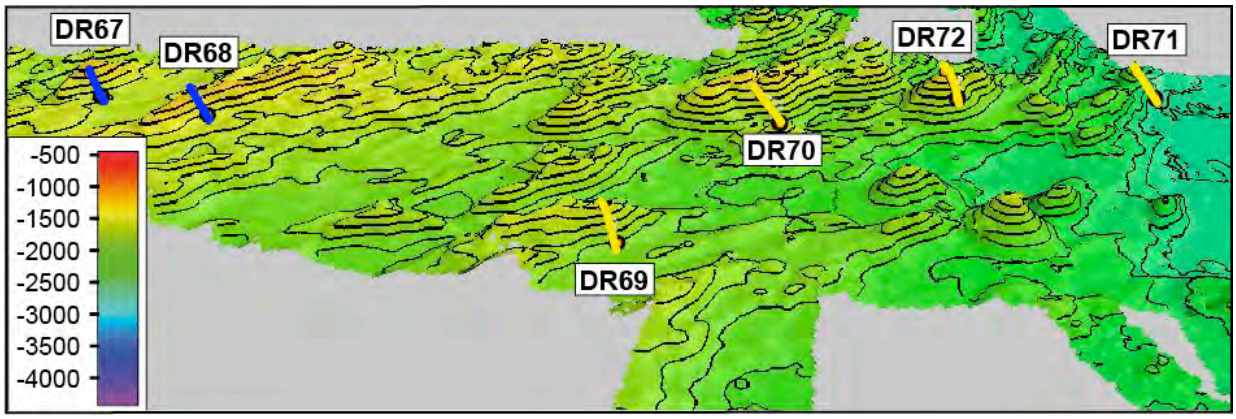


DR109 at a NE-SW-striking ridge halfway between profiles 4 and 5 (view from SSW to NNE).

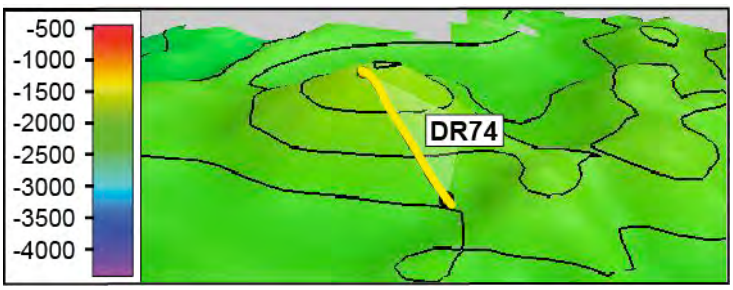
Appendix III (3D Maps of SO255 Dredge Tracks)



DR64 - 66 at a fault scarp and seamounts along the eastern section of the northernmost profile 6 across the Havre Trough (view from NNE to SSW).

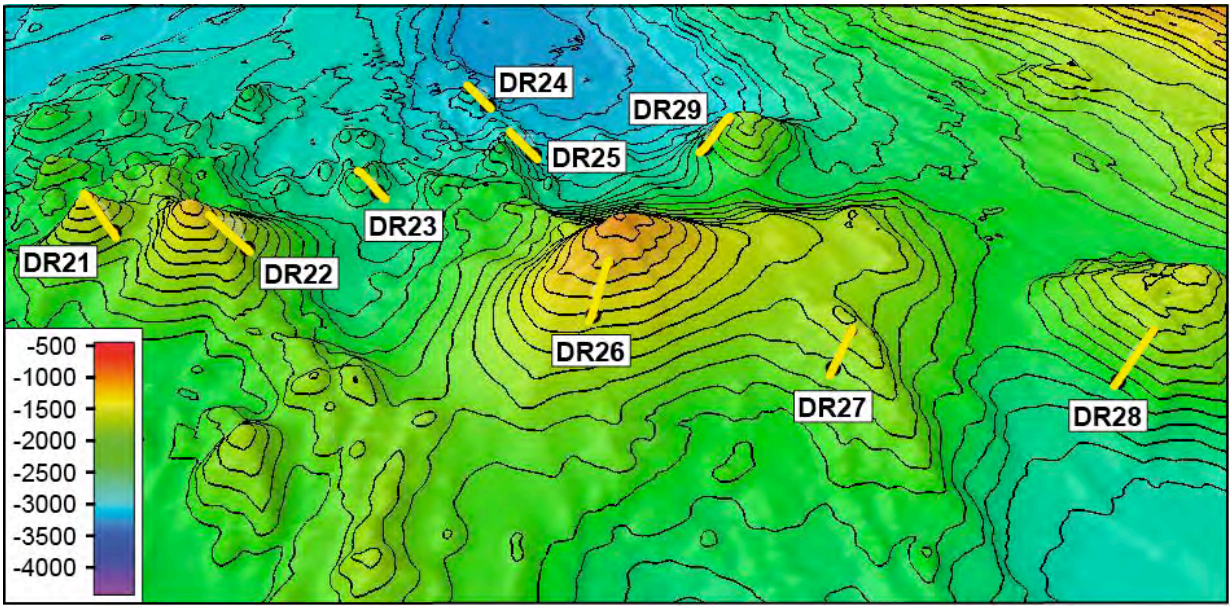


DR67-72 at small cones, ridges, and elongated seamounts along profile 6 (view from NNE to SSW).

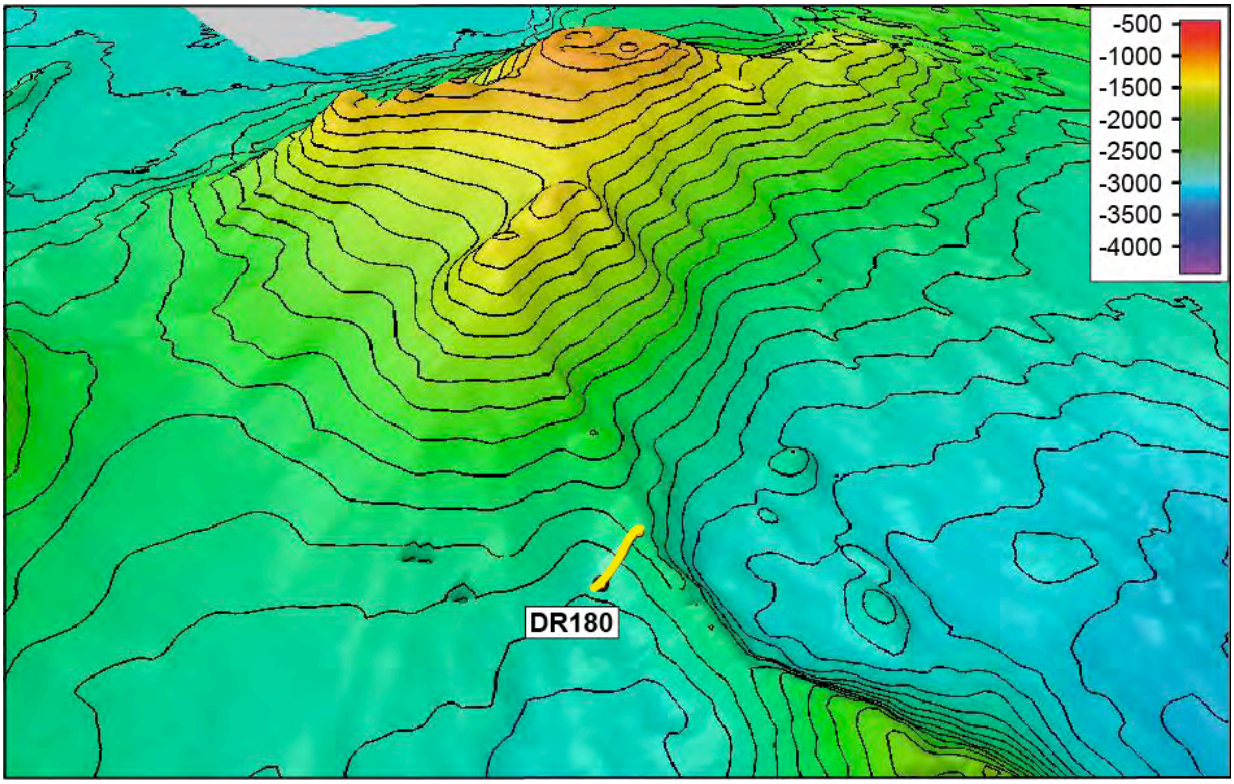


DR74 at a small cone at the western termination of profile 6 (view from N to S).

(E) Dredge sites at the volcanic front

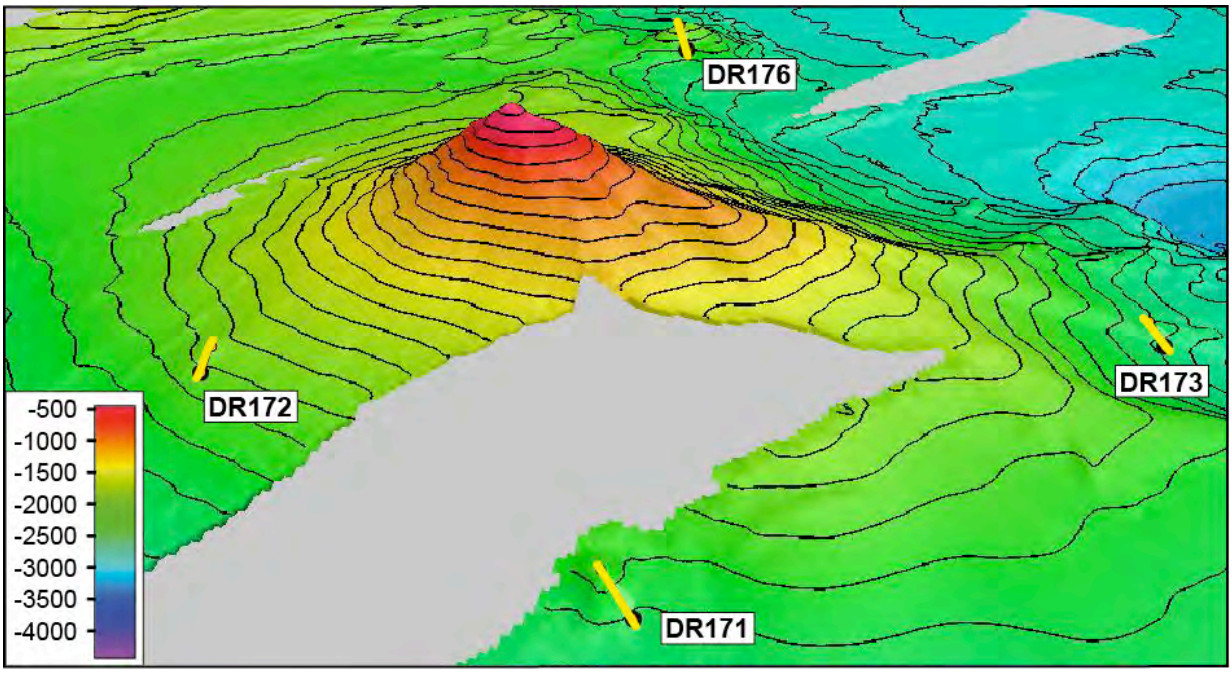


DR21 - 29 at Kibblewhite Volcanic Complex (view from SW to NE)

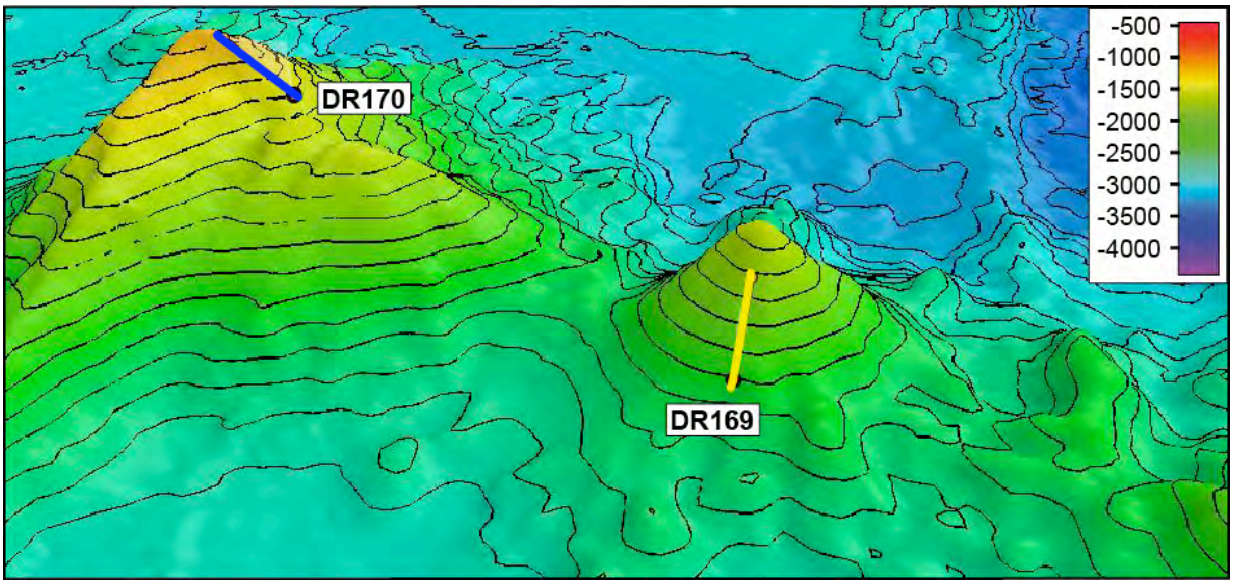


DR180 at the base of Sonne Volcano (view from WSW to ENE).

Appendix III (3D Maps of SO255 Dredge Tracks)

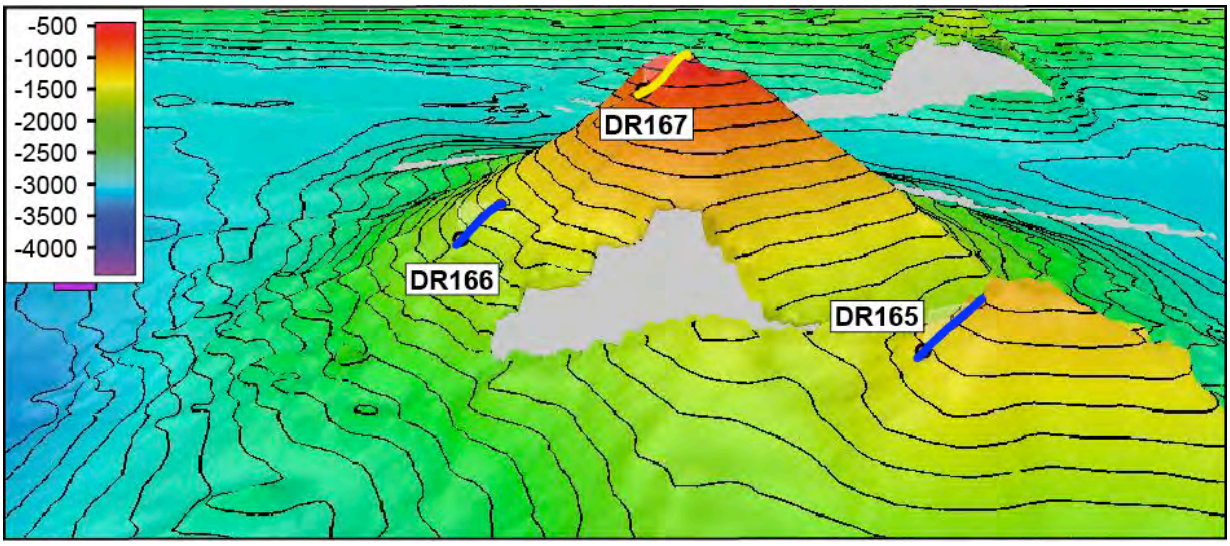


DR 171 - 173 and 176 at Ngatoroirangi Volcano (view from NNW to SSE).

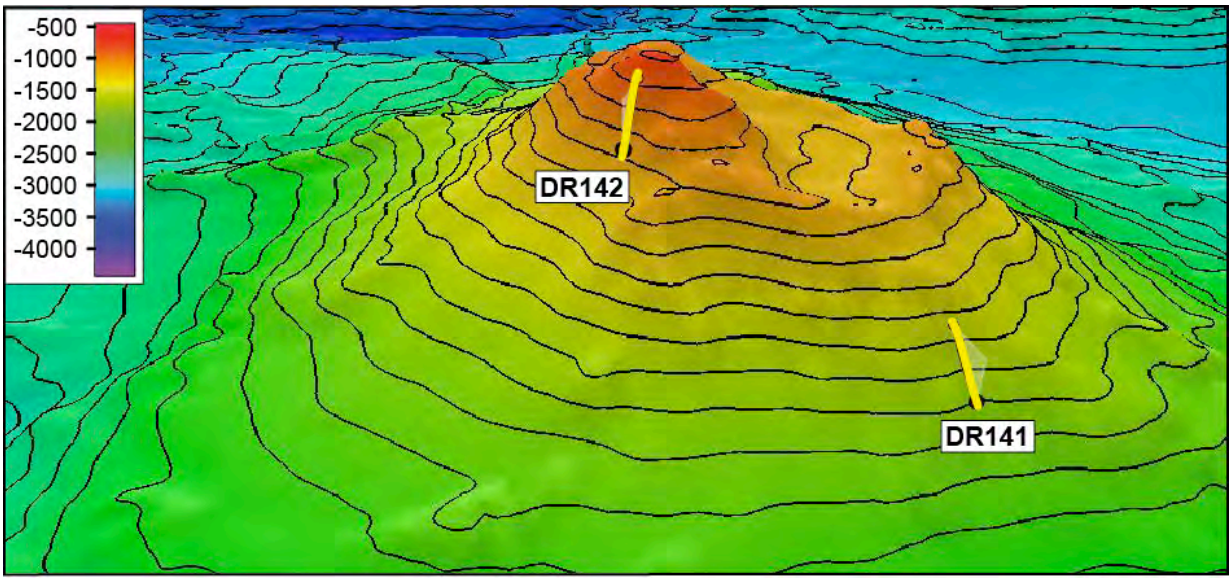


DR169 and 170 at two unnamed volcanoes about halfway between Ngatoroirangi and Kuiwai volcanoes (view from NE to SW).

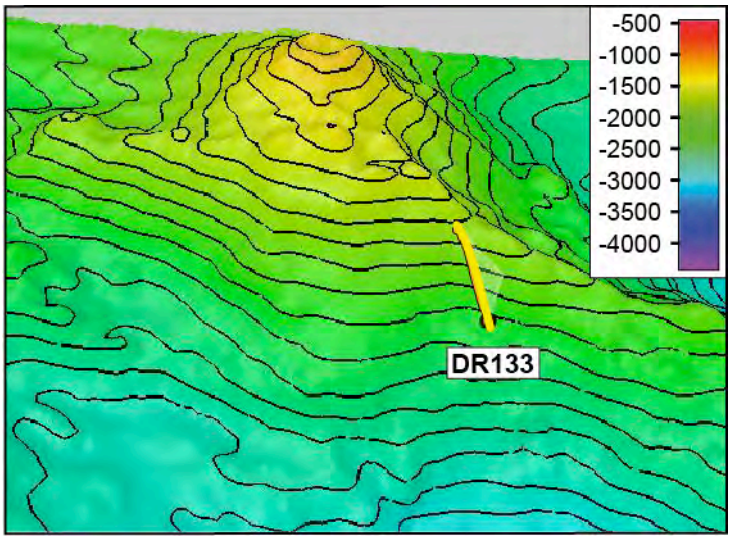
Appendix III (3D Maps of SO255 Dredge Tracks)



DR165 - 167 at Kuiwai Volcano (view from WNW to ESE).

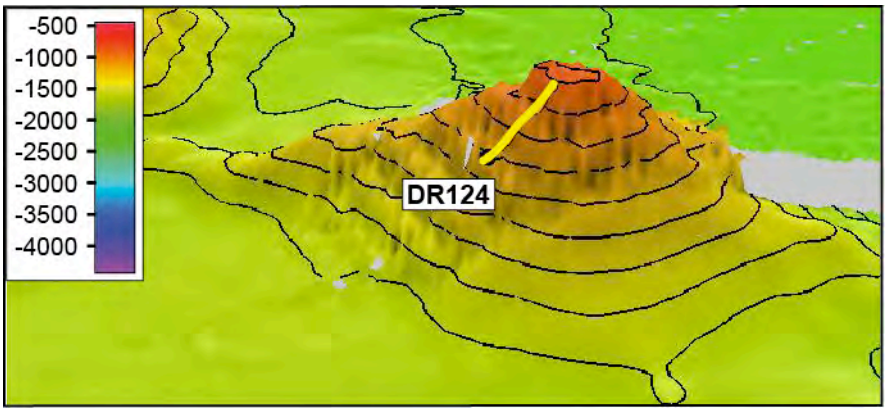


DR141 and 142 at Haungaroa Volcano (view from SE to NW).

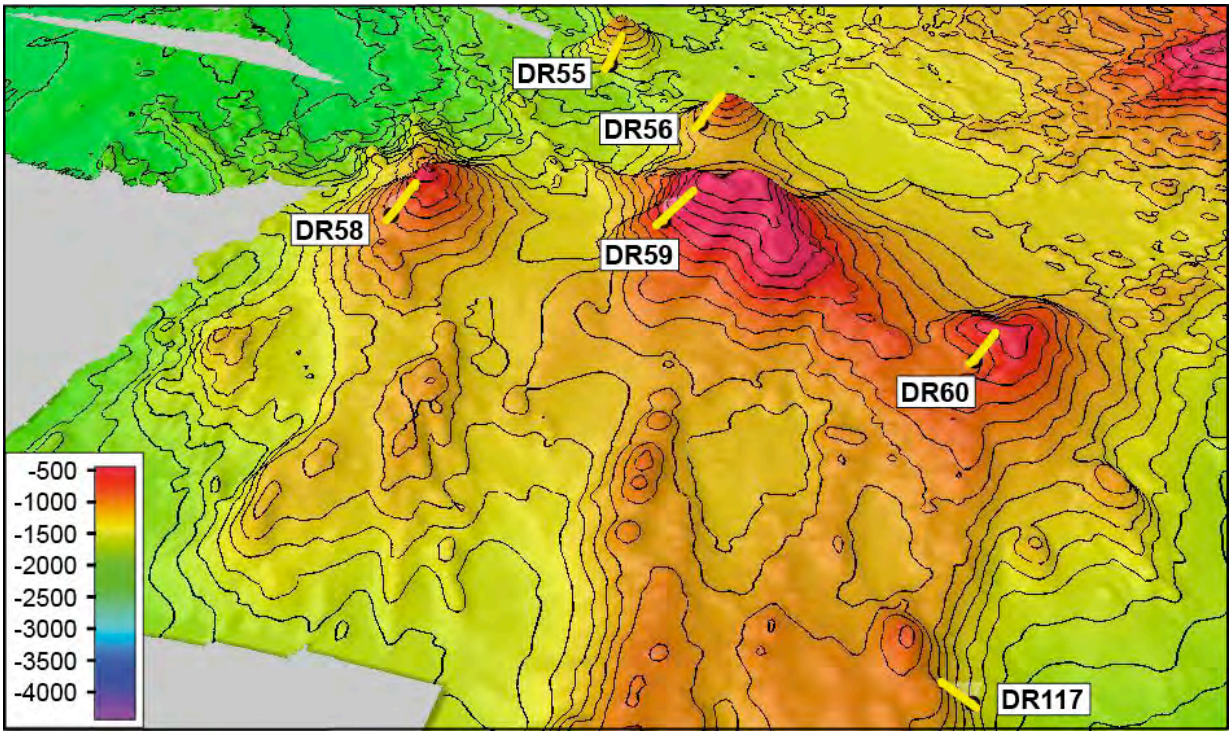


DR133 at an unnamed volcano directly west of the Kermadec Ridge (view from WNW to ESE).

Appendix III (3D Maps of SO255 Dredge Tracks)



DR124 at an unnamed volcano northeast of Havre Volcano (view from SE to NW).



DR55, 56, 58 - 60, and 117 at Giggenbach Volcanic Field (view from WSW to ENE).

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35	RV SONNE Fahrtbericht/Cruise Report SO255, VITIAZ – The Life Cycle of the Vitiaz-Kermadec Arc / Backarc System: from Arc Initiation to Splitting and Backarc Basin Formation, Auckland (New Zealand) - Auckland (New Zealand), 02.03.-14.04.2017, Eds.: Kaj Hoernle, Folkmar Hauff, and Reinhard Werner with contributions from cruise participants, DOI: 10.3289/GEOMAR_REP_NS_35_2017

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